Vol. 888 Number 3

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

July 20, 1971

U. S. DEPARTMENT OF COMMERCE

Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

July 20, 1971 Volume 888 Number 3

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of July 20, 1971

D. 219,874	3,539,938	3,557,853	3,565,883
D. 219,976	3,542,030	3,558,392	3,566,017
3,171,159	3,542,305	3,558,435	3,567,008
3,452,225	3,542,382	3,558,845	3,567,409
3,456,018	3,545,941	3,558,979	3,567,643
3,460,316	3,546,098	3,559,269	3,567,682
3,469,119	3,547,761	3,559,401	3,567,905
3,473,934	3,547,861	3,560,483	3,567,995
3,500,311	3,549,340	3,560,559	3,568,206
3,501,622	3,549,559	3,562,478	3,568,851
3,516,955	3,551,085	3,562,501	3,569,740
3,517,675	3,551,414	3,562,687	3,570,463
3,519,565	3,551,917	3,562,744	3,570,816
3,524,862	3,553,315	3,563,761	3,571,569
3,525,535	3,553,940	3,563,952	3,571,833
3,526,409	3,555,331	3,564,094	3,572,101
3,528,083	3,555,384	3,564,516	3,572,493
3,532,459	3,556,530	3,564,873	3,572,689
3,533,081	3,557,066	3,565,586	3,573,011
3,534,905	3,557,105	3,565,748	3,574,685
3,535,270	3,557,244	3,565,749	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 15, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-22-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-01-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-17-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-09-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	10-01-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-20-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-01-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-02-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	2-17-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-23-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	5-01-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	3-02-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-03-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	7-09-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	3-03-70

Expiration of patents: The patents within the range of numbers indicated below expire during July 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,682,658 to 2,685,084, inclusive
Plant Patents..... Numbers 1,288 to 1,293, inclusive

DEFENSIVE PUBLICATIONS

JULY 20, 1971

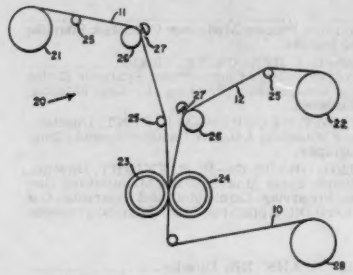
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T888,001
COMPOSITE FILM STRUCTURE AND METHOD OF MAKING IT

George Marshall Drake, Jr., Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 6, 1970, Ser. No. 17,243
Int. Cl. C09j *5/02*
U.S. Cl. 156—306
1 Sheet Drawing. 13 Pages Specification



A method of laminating two or more uncoated thermoplastic films, each selected from the group consisting of polyethylene, polypropylene, an ionic hydrocarbon polymer, polyethylene terephthalate and nylon, comprising: treating at least one of the film surfaces by flame, electrical discharge or chlorination to promote adhesion; compacting the treated surface together under moderate pressure (at least 25 pounds per square inch) and moderate heat (60° C.–90° C.) to form a composite film structure; and winding the composite film structure onto a core while under tension.

This composite film structure formed by this method has a bond strength of at least 25 grams per inch.

T888,002
PROCESS FOR DYEING AROMATIC POLYAMIDE FIBERS FROM A PHOSPHATE SURFACTANT BENZALDEHYDE CONTAINING DYEBATH AND COMPOSITION THEREFOR

Charles Thomas Hughes, Naperville, Ill., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

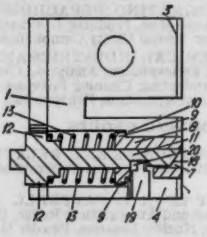
Filed Mar. 11, 1970, Ser. No. 18,695
Int. Cl. D06p *5/04*
U.S. Cl. 8—171
No Drawing. 12 Pages Specification

Benzaldehyde and a non-ionic surface active agent selected from the group consisting of (1) a substantially neutral reaction product of an alkyl acid phosphate and ethylene or propylene oxide and (2) a block polymer consisting of the reaction product of a polyoxypropylene having a molecular weight of from about 1700 to about 2100 and ethylene oxile produces a stable mixture that when mixed into water results in a stable highly dispersed emulsion of benzaldehyde in the water and yet has extremely low foaming characteristics upon agitation. The benzaldehyde-water emulsion is useful as a dyebath medium in high agitation dyeing techniques such as a jet-dyeing technique.

T888,003
SEALING JAWS FOR PACKAGING MACHINES

Michael John Herbert Haley and Barry James Oakley, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 17, 1970, Ser. No. 64,318
Int. Cl. B22b *31/18, 31/20*
U.S. Cl. 156—515
1 Sheet Drawing. 2 Pages Specification



A hole surrounded by a plane ring is formed in a crimped web-like seal of one end of a form and fill package by the disclosed sealing jaws. The sealing jaws contain heating elements and have intermeshing saw-toothed surfaces and are movable towards and away from each other. One of the jaws carries a movable punch member which is retained within the jaw, the other jaw is formed with a cavity to receive the punch. After the surfaces of the two movable sealing jaws are together and the jaws are closed, the punch member is instantaneously activated thereby forming an opening in that portion of the material held between the jaws. Slideable bushings having substantially flat surfaces are provided about the punch member and the cavity to form the plane ring produced in the seal, the balance of the seal being a web-like crimped material. In cooperation with the movable jaws carrying the punch member there may also be provided an additional set of jaws spaced from and carried with the jaws carrying the punch member. In this manner the packaging material, such as polypropylene which is coated with a heat sealable material, is continuously placed between the sets of jaws and sealed, the jaws carrying the punch member forming the top seal of the package while the other set of jaws forming the bottom seal of the next package. The space between the two seals thus produced is next cut, thereby separating the bags.

The resulting crimped seal having an opening surrounded by a plane ring is useful for hanging or display bags such as those containing candy that are suspended from a wire passing through the hole formed in the top of the bag.

T888,004
MINIMIZING DIFFERENTIAL SHRINKAGE OF MULTILAYER CERAMIC CIRCUIT BOARDS

William R. Keller, 3211 Kamerer Drive, Wilmington, Del. 19803

Filed Sept. 1, 1970, Ser. No. 68,757
Int. Cl. B32b *31/26;* C04b *39/00*
U.S. Cl. 156—89
No Drawing. 11 Pages Specification

In the process for producing multilayer ceramic circuit boards comprising laminating by firing two or more layers of green ceramic tape, wherein one or more surfaces of the layers of tape have electrical components printed thereon and wherein the green ceramic tape shrinks differentially in its width or x-axis direction as compared to its length or y-axis direction when fired, the improvement which comprises minimizing differential shrinkage of the circuit boards upon firing by stacking the layers of green tape alternately so that each successive layer has its x-axis direction aligned with the y-axis direction of the preceding layer. The green ceramic tape comprises finely divided ceramic particles and an organic binder therefor and is prepared by doctor blading an aqueous or organic dispersion of the ceramic particles and the binder, followed by eliminating the solvent, e.g., by drying. After stacking the layers of green tape in the above-describd orientation, the layers are laminated, e.g., by heat or pressure, and then fired to sinter the ceramic layers and to remove the binder.

T888,005
PHOTOGRAPHIC SILVER HALIDE EMULSIONS HAVING INCREASED COVERING POWER

Glen M. Dappen and Thomas E. Whiteley, both of 1669 Lake Ave., Rochester, N.Y. 14615

Filed Sept. 4, 1970, Ser. No. 69,978
Int. Cl. G03c *1/02*
U.S. Cl. 96—94
No Drawing. 17 Pages Specification

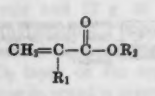
The covering power of developed silver of photographic gelatino silver halide coatings is increased by the addition of inorganic ammonium salt covering power agents such as ammonium sulfate or ammonium nitrate. These agents may be combined with a polyacrylamide to provide even greater increases in covering power. For example, a fine grained chlorobromide emulsion containing 60 g./mole Ag of $(NH_4)_2SO_4$ is coated on a cellulose acetate support at 168 mg./ft.^{2} Ag and 600 mg./ft.^{2} gelatin. Upon exposure and development it is found that the incorporation of the ammonium sulfate in the emulsion markedly increases the maximum density and the covering power of the developed silver, as compared with emulsions containing polymeric covering power agents.

T888,006
TOBACCO SMOKE FILTER

Gerald P. Morie, 2317 Briarcliff Road, Kingsport, Tenn. 37660

Filed Sept. 21, 1970, Ser. No. 74,238
Int. Cl. A24d *1/06*
U.S. Cl. 131—266
No Drawing. 8 Pages Specification

Tobacco smoke filter comprising cross-linked homopolymers and copolymers prepared from monomers having the formula



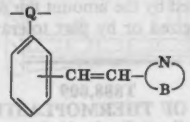
wherein R_1 is hydrogen or methyl and R_2 is an alkyl group containing 1–8 carbon atoms or a hydroxyl group attached to an alkyl group having 1–8 carbon atoms. The polymers are characterized by a macroreticular structure, a size of about 20 to about 200 mesh, surface area of about 100 to about 500 m.^{2}/g., and pore diameters of about 10 A. to about 300 A. The filters may be three component filters in which the polymeric material is packed between two plugs of filter material or the polymeric material may be added to tow which is then formed into filter rods.

T888,007
PHOTO-SENSITIVE POLYMERS

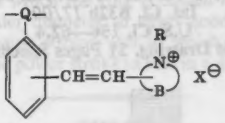
Richard C. Tuites, Thomas M. Laakso, Jack L. R. Williams, and Louis M. Minsk, all of Kodak Park, Rochester, N.Y. 14650

Filed Sept. 29, 1970, Ser. No. 76,630
Int. Cl. G03c *1/68*
U.S. Cl. 96—115
No Drawing. 18 Pages Specification

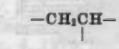
There are disclosed light-sensitive polymers containing recurring groups having the formula



and quaternary salts thereof having the formula



wherein Q is a unit in the parent polymer chain e.g.,



R is a lower alkyl group, $X^{\ominus}$ is an anion, and B represents the atoms necessary to complete a pyridine or quinoline moiety, the group $\{CH{=}CH\}$ being attached to a ring carbon atom in the nitrogen-containing ring. A method is disclosed for preparing the quaternary salts which comprises reacting a polymer of vinyltoluene with N-bromosuccinimide in the presence of benzoyl peroxide to brominate the methyl group on the toluene ring, reacting the resultant product with dimethyl sulfoxide in the presence of sodium bicarbonate to convert the bromomethyl groups to aldehyde groups and thereafter condensing the aldehyde groups on the polymer with an aromatic, quaternized compound such as the methyl p-toluene sulfonate quaternary salt of 2-picoline. The light-sensitive polymers are useful in photomechanical reproduction processes such as for lithographic purposes or as photoresists.

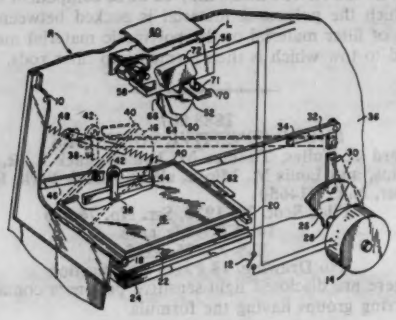
T888,008
POSITIONING MECHANISM

William A. MacDonald, Jr., 901 Elmgrove Road, Rochester, N.Y. 14650

Filed Nov. 9, 1970, Ser. No. 88,032
Int. Cl. G03b *27/70*
U.S. Cl. 355—45
3 Sheets Drawing. 10 Pages Specification

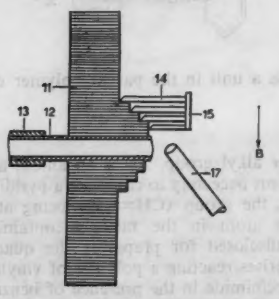
A latch mechanism is provided for supporting a pivotal mirror in a raised position in the optical path of a reader-printer to deflect a projected image from a primary path to a secondary path. The latch mechanism includes a latch lever adjacent a switch lever which is operated by movement of the mirror through suitable drive means so that the mirror is moved past the latch lever before it engages the switch lever to shut off power to the motor. After power is shut off the mirror moves in the reverse direc-

tion under the influence of gravity against the latch lever which holds the mirror in a fixed, predetermined position



which is not affected by the amount the drive motor coasts after it is de-energized or by part tolerances.

T888,009
PRODUCTION OF THERMOPLASTICS ARTICLES
Robert Lawrence Scott-Cook, % Imperial Chemical Industries, Ltd., Plastic Division, Bessemer Road, Welwyn Garden City, Hertfordshire, England
Filed Nov. 13, 1970, Ser. No. 89,351
Int. Cl. B32b *17/00*
U.S. Cl. 156—62.4
2 Sheets Drawing. 21 Pages Specification

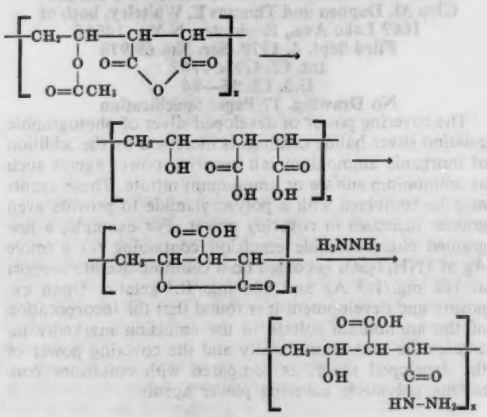


Fibers for the manufacture of non-woven materials are produced by superimposing a plurality of layers of thermoplastic film on a reel, rotating the reel thus formed on a lathe and feeding a cutting tool across the superimposed layers of film towards the axis of the lathe as it rotates. If the cutting tool is advanced across the edge of the reel by a distance per revolution of the reel which is greater than the thickness of the film, the individual fibers thus produced have broken fibrils spaced widely apart along their length. If the distance per revolution is less than the thickness of the film a network of interconnected fibers is produced. As the thermoplastic material, uniaxially or biaxially oriented polypropylene or polyethylene terephthalate is used, coated on at least one side, preferably both, with a heat sensitive coating such as a vinyl chloride polymer or copolymer.

The denier of the fibers varies with the thickness of the film used including coating and the amount of film shaved by the cutting tool or tools. The fibers are collected by suitable means adjacent to the cutting tool and formed into a non-woven material, first by arranging them in a random distribution pattern by any convenient process, such as air laying on a perforated drum, and optionally blending with other fibers, then bonding together with heat and pressure sufficient to fuse the heat sensitive material, using conventional techniques. Non-woven fabrics thus produced are used in the manufacture of garments as stiffening in wearing apparel and as interlinings. They are optionally laminated to other fabrics.

T888,010
FLEXIBLE FILM-FORMING POLYMERS CAPABLE OF INSOLUBILIZATION
Edward P. Abel and Louis M. Minsk, both of 1669 Lake Ave., Rochester, N.Y. 14615
Filed Nov. 18, 1970, Ser. No. 90,809
Int. Cl. C08g *9/04*
U.S. Cl. 260—72R
No Drawing. 17 Pages Specification

Flexible film-forming polymers which are capable of being insolubilized are obtained by reacting a polymeric γ-lactone with a diamine such as hydrazine or ethylenediamine. The polymeric γ-lactones are ester lactones of the type disclosed by U.S. 2,306,071 and U.S. 2,861,056 and are obtained, for example, by polymerizing a mixture of vinyl acetate and maleic anhydride to obtain a heteropolymer which is reacted with water and/or alcohol to obtain the polymeric lactone. The latter is then reacted with the diamine to introduce monoreacted hydrazide groups along the chain. Solutions of the resulting polymer can then be used to form coatings or films which are insolubilized by treatment with a tanning or hardening agent such as formaldehyde. The polymer is especially useful for forming conductive coatings such as an antistatic layers for photographic films. For this purpose, it can be used alone or admixed with gelatin or other polymers of similar solubility. The formation of the polymer can be represented as follows:



T888,011
RECEIVING SHEET FOR PHOTOGRAPHIC DIFFUSION TRANSFER PROCESS
Robert E. Stauffer, % Kodak Park Works, Rochester, N.Y. 14650
Filed Nov. 19, 1970, Ser. No. 91,044
Int. Cl. G03c *1/48*
U.S. Cl. 96—76
1 Sheet Drawing. 15 Pages Specification

A receiving sheet for diffusion transfer processes wherein the print receiving element comprises a cation exchange membrane support. The cation exchange resin reduces the alkalinity of residual processing composition retained

on the print thus reducing developer stain, dye discoloration, and the like. The support may also include an inert layer interposed between the print receiving layer and the cation exchange resin membrane support which delays or modulates the reduction in alkalinity.

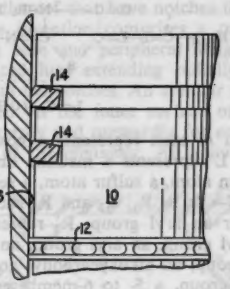
T888,012
PHOTOGRAPHIC FILMS HAVING CARBON-CONTAINING BACKING LAYERS
Herbert S. Elins, 1669 Lake Ave., Rochester, N.Y. 14615
Filed Nov. 25, 1970, Ser. No. 92,618
Int. Cl. G03c *1/78*
U.S. Cl. 96—87
No Drawing. 24 Pages Specification

Certain photographic films, such as color films of the type disclosed by Mannes et al. U.S. Pat. 2,252,718, have an antihalation or antistatic backing layer composed of carbon black dispersed in a cellulosic binder. A problem may occur with this type of film, especially under conditions of high humidity, when the carbon-containing layer is in contact with the top emulsion layer as happens when the film is tightly wound upon itself. This problem is apparently associated with oxidation of materials in the top emulsion layer and, in the case of color film of the type indicated, manifests itself in the phenomenon known as "yellow mottle ferrotyping." The problem is avoided or reduced in accordance with the present invention by placing an antioxidant, such as a hydroquinone, a catechol, an aminophenol, a 3-pyrazolidone, an ascorbic acid derivative, a reductone or a phenylenediamine in the carbon-containing backing layer or in an overcoat layer for the top emulsion layer or for the backing layer. Antioxidants, such as ascorbyl palmitate, 3-hydroxy-5-(4-pyridyl)-tetronimide, piperidinohexose reductone, and 2-(2-octadecyl)-5-(2-sulfo-tertiary butyl) hydroquinone, employed in this manner, not only prevent yellow mottle ferrotyping when the color film comes in contact with the carbon-containing backing layer, but prevent loss of latent image in the film caused by air oxidation under humid conditions.

T888,013
ELECTROPHOTOGRAPHIC SPEED OF INORGANIC PHOTOCONDUCTORS IS INCREASED BY THE ADDITION OF ORGANIC PHOTOCONDUCTORS
Paul B. Gilman, Jr., 1669 Lake Ave., Rochester, N.Y. 14615
Filed Nov. 27, 1970, Ser. No. 93,449
Int. Cl. G03g *5/06, 5/08*
U.S. Cl. 96—1.5
No Drawing. 19 Pages Specification

The electrophotographic speed of inorganic photoconductor and xeroradiographic compositions, such as those containing TiO_2 and PbO, can be improved by including an organic photoconductor in the electrophotographic element. The organic and inorganic photoconductors can be in separate layers or in the same layer of the element. For example, a solution of 398 g. of toluene, 52.7 g. of polyvinyl butyral binder resin, 17.5 TiO_2 is coated on a clay-coated conductive paper. Over the resulting layer of TiO_2-binder resin is coated at a wet thickness of 0.006 inch a solution of 200 g. methylene chloride, 18 g. polycarbonate binder resin and 12 g. of the organic photoconductor 4,4' - diethylamino-2,2'-dimethyltriphenylmethane. The double coated element has greater sensitivity than either the TiO_2 layer or the organic photoconductor alone. The increase in speed is greater than the cumulative speed of the separate components. Similar improvement occurs when the organic photoconductor (1.0 g. in 0.5 ml. methylene chloride) is added to 25 ml. of a TiO_2 dispersion in polyvinyl butyral resin and coated at 0.004 inch wet thickness on conducting paper.

T888,014
PISTON RING AND GROOVE
Robert B. Cambron and Lemoyne E. Ott, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 4, 1970, Ser. No. 95,080
Int. Cl. F16j *9/12*
U.S. Cl. 277—138
1 Sheet Drawing. 4 Pages Specification



A piston ring of half-keystone configuration fitting loosely within a conventional ring groove of rectangular cross-section in which the ring is dished or twisted when closed to cylinder diameter to effect good sealing during intake and exhaust strokes and in which the ring is distorted during the power stroke to seal in a different manner.

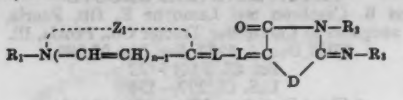
T888,015
SUPERSENSITIZED PHOTOGRAPHIC SILVER HALIDE EMULSIONS
Norman W. Kalenda, 1669 Lake Ave., Rochester, N.Y. 14615
Filed Dec. 4, 1970, Ser. No. 95,125
Int. Cl. G03c *1/28*
U.S. Cl. 96—124
2 Sheets Drawing. 3 Pages Specification

Photographic silver halide emulsions are supersensitized by incorporating in the emulsion benzimidazolocarbocyanine dyes with unsymmetrical carbocyanine dyes having 1H-imidazo[4,5-b]quinoline nuclei. An example is a gelatin-silver bromoiodide emulsion of the type described by Trivelli et al. [Phot. Journ. 79, 330 (1939)] coated at 300 mg./ft.^{2} on a cellulose acetate film base and containing 0.08 mg./mol Ag of 4,4',5,5'-tetrachloro-1,1',3,3'-tetraethyl - benzimidazolocarbocyanine iodide and 0.08 mg./mol Ag of 1,3,3'-triethyl-1H-imidazo[4,5-b]quinothiacarbocyanine iodide. Other supersensitizing dye combinations for such emulsion include: (a) 5,5'-dichloro-1,1',3,3' - tetramethylbenzimidazolocarbocyanine iodide and 1,3,3'-triethyl-1H-imidazo[4,5 - b]quinothiacarbocyanine iodide; (b) 5,5'-dichloro-1,1',3,3'-tetraethylbenzimidazolocarbocyanine iodide and 1,3,3'-triethyl-1H-imidazo[4,5-b]quinothiacarbocyanine iodide; and (c) 5,5',6,6'-tetrabromo-1,1',3,3'-tetraethylbenzimidazolocarbocyanine iodide and 1,3,3'-triethyl-1H-imidazo[4,5-b]-quinothiacarbocyanine iodide.

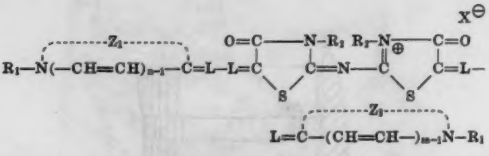
T888,016
PHOTOGRAPHIC MATERIALS
Norman W. Kalenda, Kodak Park, Rochester, N.Y. 14650
Filed Dec. 4, 1970, Ser. No. 95,419
Int. Cl. G03c *1/10*
U.S. Cl. 96—126
No Drawing. 27 Pages Specification

Photographic silver halide emulsions contain a sensitizing combination comprising a merocyanine dye having an imino group on the acidic nucleus thereof, and a pyri-

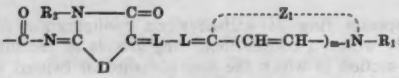
dine and/or a quinoline base. The preferred merocyanine dyes have one of the following formulas:



and



wherein *n* and *m* each represents a positive integer of from 1 to 2; L represents a methine linkage; D represents an oxygen atom, a sulfur atom, a selenium atom or the group =N—R; R, R_1, R_2 and R_4 each represents an alkyl group or an aryl group; R_3 represents an amino group, an alkyl group, an aryl group, an acyl group, an arylsulfonyl group, an alkoxycarbonyl group, a carboxyalkylcarbonyl group, a 5- to 6-membered nitrogen containing heterocyclic group, and the group



wherein Z_1, *m*, D, R_1 and R_2 are as above defined; X represents an acid anion; and Z_1 and Z_2 each represents the non-metallic atoms necessary to complete a nitrogen containing heterocyclic nucleus containing from 5 to 6 atoms in the heterocyclic ring. A preferred combination comprises 3 - ethyl-5-[(3-ethyl-2-benzothiazolinylidene)ethylidiene]-2-p-carboxyphenylimino-4-thiazolidinone and pyridine.

T888,017
COATING OF SILVER HALIDE DOTWISE
Edward C. Yackel and Donald P. Foster, both of 1669 Lake Ave., Rochester, N.Y. 14615
Filed Dec. 10, 1970, Ser. No. 97,020
Int. Cl. G03c *1/02*
U.S. Cl. 96—94
No Drawing. 18 Pages Specification

The coating of a silver halide emulsion dotwise is accomplished by gravure or letterpress printing procedures by using a novel emulsion composition comprising certain gelatin "anti-bonding" agents such as, for example, ethyl carbamate, acetamide, urea, ethyl carbonate, sulfamide, methyl sulfamide, formamide or semicarbazide. Also useful, but somewhat less effective, are n-butyl carbamate, dimethyl sulfone and succinimide. The most suitable compositions for dotwise printing are silver halide emulsions of low gelatin content to which an anti-bonding agent is added, containing, for example, at least 1 weight percent silver halide, at least 25 weight percent water, 1 to 10 weight percent gelatin and at least 3 weight percent of an antibonding agent of the type indicated. The viscosity range for the emulsions should be from 1/16 to 3 poise for gravure printing and from 5 to 500 poise for letterpress printing.

REISSUES

JULY 20, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

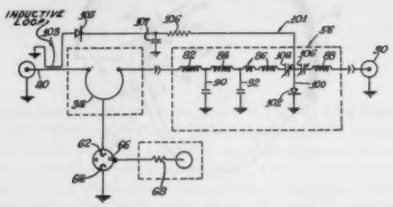
27,154
GASEOUS-SOLID STATE POWER LIMITER HAVING A SELF-BIASING CIRCUIT FOR THE SOLID STATE DEVICE

David C. Broderick, Beverly, Mass., assignor to Metcom, Inc., Salem, Mass.

Original No. 3,364,445, dated Jan. 16, 1968, Ser. No. 527,396, Feb. 4, 1966, which is a continuation-in-part of Ser. No. 214,546, Aug. 3, 1962. Application for reissue Jan. 14, 1969, Ser. No. 802,296

Int. Cl. H01p *1/04*

U.S. Cl. 333—13 8 Claims



A power limiter device having solid state means with self-biasing means for limiting and attenuating the propagation of destructively high powered signals within a wide band of radio frequency signals.

27,155
MOULDING AND SEALING MACHINES

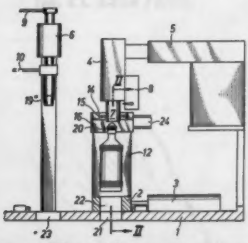
Gerhard Hansen, Hofener Strasse 47, Oeffingen, Kreis, Waiblingen, Germany

Original No. 3,325,860, dated June 20, 1967, Ser. No. 404,600, Oct. 19, 1964. Application for reissue Apr. 9, 1969, Ser. No. 824,005

Claims priority, application Germany, Oct. 30, 1963, H 50,689

Int. Cl. B29d *23/03*

U.S. Cl. 18—5BF 17 Claims



A machine for molding, filling and sealing containers in one operation from a tube of thermoplastic material and having relatively movable mold parts.

27,156
SAFETY CAP AND CONTAINER

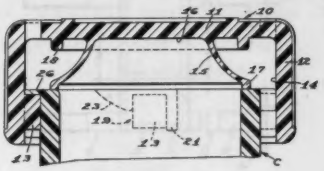
Peter Hedgewick, Windsor, Ontario, Canada, assignor to Reflex Corporation of Canada Limited, Windsor, Ontario, Canada

Original No. 3,344,942, dated Oct. 3, 1967, Ser. No. 540,338, Apr. 5, 1966. Application for reissue Apr. 19, 1968, Ser. No. 734,502

Int. Cl. B65d *55/02*

U.S. Cl. 215—9 25 Claims

The container disclosed herein comprises a cylindrical plastic body which is molded in one piece and has circumferentially spaced radially extending projections on the upper end thereof that have notches therein. The cap embodying the invention comprises a one-piece plastic body having a base and peripheral flange with circumferentially spaced lugs extending radially inwardly for engagement with the notches. An annular integral flexible web is provided on the inner surface of the base and extends downwardly and outwardly for engagement with the upper end of the container. An annular integral rib



on the inner surface of the base overlies the annular flexible web and serves as a stop to prevent overflexing of the web. The base of the cap includes circumferential openings which facilitate its manufacture as a one-piece plastic cap but do not interfere with the sealing action of the annular web. The cap is applied to the container by a rotating movement. The cap can only be removed from the container by applying an axial force on the periphery of the cap and thereafter rotating the cap.

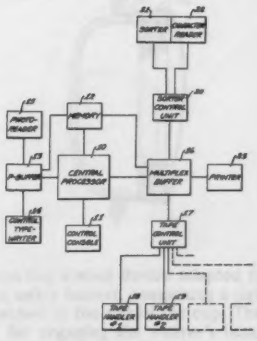
27,157
APPARATUS IN DATA PROCESSING SYSTEM FOR COORDINATING MEMORY COMMUNICATION AMONG PROCESSORS AND PERIPHERAL DEVICES

Henry L. Herold, Los Angeles, Calif., and Joseph Weizenbaum, Concord, Mass., assignors to Honeywell Information Systems Inc.

Original No. 3,354,466, dated Nov. 21, 1967, Ser. No. 8,394, Feb. 12, 1960. Application for reissue Jan. 13, 1969, Ser. No. 801,872

Int. Cl. G06f *3/00*

U.S. Cl. 340—172.5 39 Claims



A data processing system wherein a peripheral unit communicates with a memory store while the central processing unit continues to execute its normal sequence

of operations. The central data processing unit responds only to the appropriate signal to provide the necessary data item transfer and to halt the transfer thereof. A buffer register transmits or receives data words to or from the peripheral device in succession. When the buffer register is filled with the information from the peripheral unit or has transferred the information to the peripheral unit, a signal is transmitted to the central data processing unit which provides the communication between the buffer register and the memory store.

PATENTS

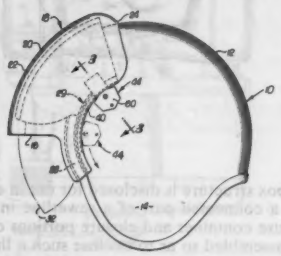
GRANTED JULY 20, 1971

GENERAL AND MECHANICAL

3,593,338
VISOR-LATCHING CONSTRUCTION IN SAFETY HELMET

William H. Penny, Arcadia, Calif., assignor to Sierra Engineering Co., Sierra Madre, Calif.

Filed Mar. 24, 1969, Ser. No. 809,864
Int. Cl. A42b 3/00
U.S. Cl. 2—6 4 Claims



A device which is particularly adapted for holding a moveable visor on a headgear in a predetermined position which includes a tooth rack mounted on the headgear and a tooth clutch or latch jaw mounted on and movable with the visor, the clutch jaw being moveable between an engaged position where the teeth on the jaw intermesh with the teeth on the rack to a disengaged position where the teeth do not intermesh, the clutch jaw being moveable between these positions responsive to the movement of a lever which is readily accessible to the wearer of the headgear.

3,593,339
DRAFTSMAN'S GLOVE

Charles W. Main, 3015 E. 5th St., and Robert L. Austin, 1800 W. 10th St., both of Anderson, Ind.

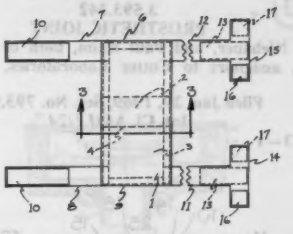
Filed June 8, 1970, Ser. No. 44,291
Int. Cl. A41d 19/00
U.S. Cl. 2—161 2 Claims

Disclosed is a draftsman's glove, useful to protect from soiling the paper or surface on which a draftsman, illustrator, artist or the like is working. The glove is formed as a tapered tube having a wrist band portion at its larger end and tapered, along one side margin, to its smaller end, a portion of the tapered side margin of the tube is open and the remaining portion, nearest the smaller end has a closed seam. This closed seam portion accommodates the little finger of the wearer and the remainder of the wearer's hand extends through the open portion of the tapered side margin of the tube, whereby only the little finger and heel of the wearer's hand is covered by the glove.

3,593,340
PROTECTION PADS

Gerald Lee Powell, 8301 Cincinnati-Dayton Road, West Chester, Ohio

Filed Aug. 29, 1969, Ser. No. 854,235
Int. Cl. A41d 13/06
U.S. Cl. 2—24 1 Claim

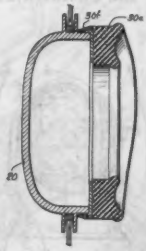


My invention provides a reusable cushioned pad with extending tapes for securing the pads to a person. The extending tape means are provided with self securing holding means when the tapes are overlapped and pressed together. The tapes are released from holding condition by separating the tapes and may be repeatedly used to secure the pads to a person without deterioration of the holding quality of the holding means. Secured at the ends of the tapes are tabs that are adapted to repeated use to overlap the tapes when they are in holding position, and lock the tapes together to prevent the tapes from separating during the time that a pad is secured to a person.

3,593,341
SOUND-ATTENUATING EARCUPS

Jackson A. Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.

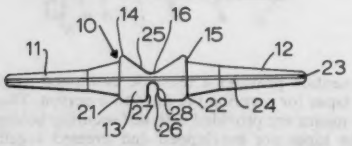
Continuation-in-part of application Ser. No. 730,264, May 20, 1968, now abandoned. This application Jan. 2, 1970, Ser. No. 219
Int. Cl. A42b 1/06
U.S. Cl. 2—209 21 Claims



A sound-attenuating earcup device adapted for use either with or without a safety helmet, comprising a rigid cup with a resilient seal attached to the rim of the cup. The seal has an annular surface for engaging the wearer's head, and has a dimension between the cup rim and the outermost head-engaging portion of this surface that varies around the periphery of the cup in accordance with the contours of a human head. In one form, the surface of the seal which comes into contact with the wearer's head includes inner and outer flanges defining a channel having diverging side

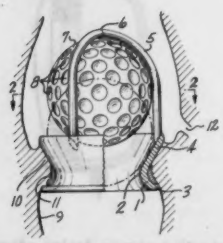
flanges. When the seal is pressed into engagement with the side of the wearer's head, the flanges spread apart and the material between the flanges is stressed in tension, thereby improving the effectiveness of the seal at the flanges and, hence, the sound-attenuating properties. The outer flange is contoured to follow the contours of a human head. A tortuous, pressure-equalizing, sound-attenuating fluid path is provided through the wall of the earcup, for use in situations where the ambient pressure is subject to variation. In another form, the seal has a wide contact surface arranged to engage the wearer's head essentially continuously between its outer and inner annular edges; the contact surface, which may be smooth or corrugated, slopes inwardly toward the center of the earcup with a pitch that varies around the cup to follow the head contours.

3,593,342
PROSTHETIC JOINT
John J. Niebauer, and Paul Kahn, both of San Francisco, Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.
Filed Jan. 27, 1969, Ser. No. 793,994
Int. Cl. A61f 1/24
U.S. Cl. 3—1 **18 Claims**



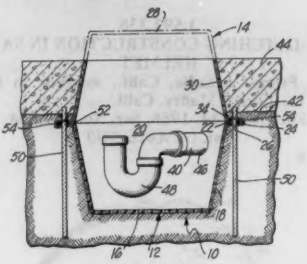
A prosthetic joint made of a fabric-reinforced unitary elastomeric member providing two tapering stems connected to opposite ends of a central portion having thick ends and a thin web and arranged to provide relative movement of one stem to the other in at least one direction while preventing movement in undesired directions. The stems are used for insertion into the interiors of each of two bones to be joined by the joint. The stems are overlaid with cloth fabric of a kind enabling better fixation of the prosthetic joint to the tissue in the bones.

3,593,343
PROSTHETIC BALL-CHECK HEART VALVE
Robert F. Viggers, 7306 57th Ave. N.E., Seattle, Wash.
Filed July 19, 1968, Ser. No. 738,143
Int. Cl. A61f 1/22
U.S. Cl. 3—1 **7 Claims**



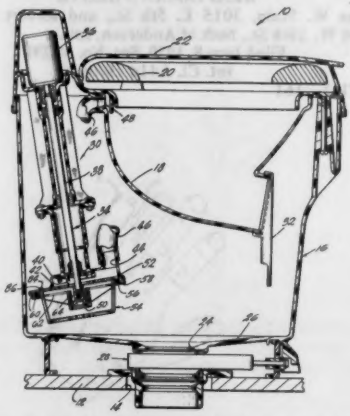
A valve ball having a relieved surface forming dimples is confined by a cage mounted on a venturi seat. The seat is secured by sewing to fibrous body membrane a cloth sewing ring received in an external groove of the seat ring. Axially extending frame rods may be joined by a flow-directing or flow-straightening ring to reduce turbulence.

3,593,344
TUB BOX STRUCTURE
Duane D. Logsdon, 1719 Canyon Road, Fullerton, Calif.
Filed May 9, 1969, Ser. No. 823,346
Int. Cl. A47k 17/00
U.S. Cl. 4—1 **2 Claims**



A tub box structure is disclosed for use in enclosing a drain trap and a connected part of a sewerline in a concrete slab floor. In use container and closure portions of this box structure are assembled so as to enclose such a line and trap, and then the concrete to form such a slab floor is cast around the structure so that the upper part of the structure is exposed above the concrete. After the concrete has set the portion of the structure exposed above the concrete is severed and connection is made to the drain trap.

3,593,345
RECIRCULATING TOILET
Charles B. Wells, Feasterville, Pa., assignor to Thetford Corporation, Ann Arbor, Mich.
Filed Jan. 9, 1970, Ser. No. 1,692
Int. Cl. E03 1/00, 3/00, 5/00
U.S. Cl. 4—10 **19 Claims**



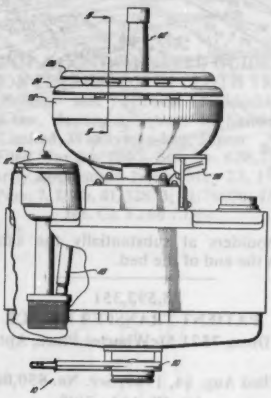
A self-contained recirculating toilet system requiring no pressure water connection or holding tank installation. The system includes a toilet bowl, a tank for holding the liquid of the system and a self-cleaning pump-and-filter apparatus for circulating a quantity of relatively clear liquid to the bowl for return to the tank. The pump is adapted to be operated by a 12-volt DC electrical circuit. The filtering system includes a strainer basket which is vibrated during operation of the pump in order to remain clog free.

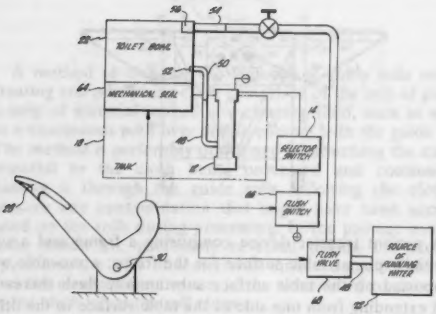
3,593,346

DUAL MODE RECIRCULATING TOILET SYSTEM

William F. Katona, Los Angeles, Calif., assignor to Monogram Industries, Inc., Los Angeles, Calif.

Filed June 4, 1970, Ser. No. 43,450
Int. Cl. E03d 1/00, 3/00, 5/00
U.S. Cl. 4—10 8 Claims





A novel toilet system is disclosed which is alternatively operable on a recirculating fluid supply or an external water supply. A foot-operated pedal, in combination with a switch selector, opens a mechanical seal to a holding tank and energizes the flushing operation. A novel, slide valve directs the flushing fluid from the selected source.

In a specific embodiment, the toilet retracts into a wall fixture and combines a movable bowl member with a fixed receiver member. Separate flush lines clean the bowl and the receiver when in the retracted configuration.

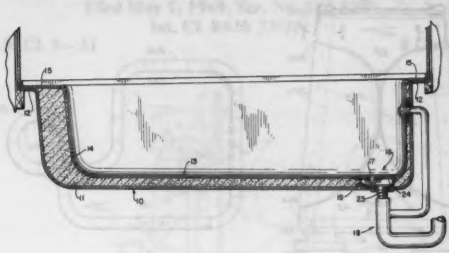
3,593,347

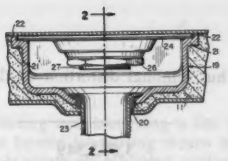
BATHTUB RENOVATING ADAPTOR APPARATUS AND METHOD

Alfred Nemiroff, New York, N.Y., assignor to The P. I. Nemiroff Corporation, New York, N.Y.

Filed Aug. 25, 1969, Ser. No. 852,742
Int. Cl. E03c 1/22, 1/28
U.S. Cl. 4—197 7 Claims

The present invention includes a renovating method and apparatus for accommodating the waste and overflow connections of an inserted bathtub liner assembly and an existing plumbing system to which an existing bathtub was previously connected. A hollow container formed with an outlet port is secured to said plumbing system. A cover member slidable against the hollow container and formed with an inlet port is moved until the distance between said ports corresponds to the distance between said connections and the system. The cover member is then bonded to the hollow container and





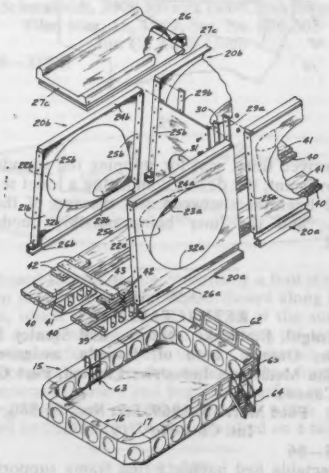
the waste connection is fitted to said inlet port such that an adapting plumbing trap exists between the liner and said system.

3,593,348

MODULAR SWIMMING POOL CONSTRUCTION

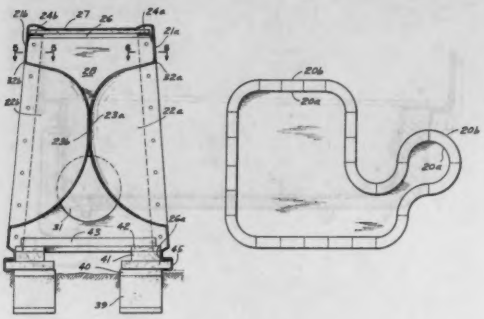
Fred Toerge, Stamford, Conn., assignor to International Swimming Pool Corporation, Deer Park, N.Y.

Filed Dec. 22, 1969, Ser. No. 886,876
Int. Cl. E04h 3/18, 3/16
U.S. Cl. 4—172.19 15 Claims



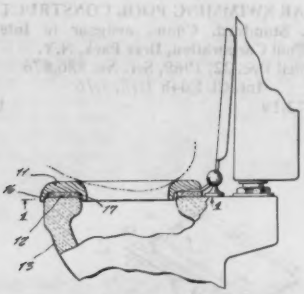
A swimming pool, the sidewalls of which are constructed by selectively joining a plurality of modules having straight or curved sidewalls. By selectively joining such modules a great variety of different geometrical outlines of the pool area is obtainable. Each module includes in its inner and outer wall an archlike structure which transmits hydrostatic pressure

upon the inside wall of the module to the outside wall thereof in a manner such that the forces of pressure are substantially



in balance. Thus minimal distortion of the modules is obtained.

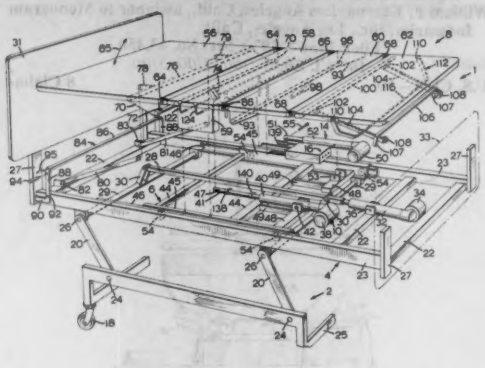
3,593,349
WHISPER SEAT
Paul Bungo, 964 Hazel Ave., Ambridge, Pa.
Filed Sept. 15, 1969, Ser. No. 858,092
Int. Cl. A47k *13/00*
U.S. Cl. 4—237 **2 Claims**



An improved toilet seat for stopping the sounds during a bowel movement, the device comprising a toilet seat with an acoustical liner therebetween and the top of the ceramic commode; and the liner being possibly deodorent impregnated.

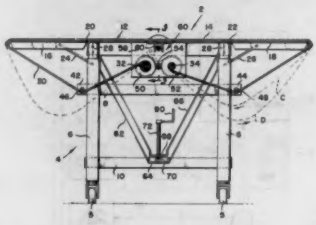
3,593,350
RETRACTABLE BED
Robert Knight, Etobicoke, Ontario, and Stanley Rachlinski, Oakville, Ontario, both of, Canada, assignors to The Dominion Metalware Industries Limited, Port Credit, Ontario, Canada
Filed Mar. 13, 1969, Ser. No. 806,880
Int. Cl. A61g *7/10, 7/00*
U.S. Cl. 5—66 **45 Claims**

A retractable bed having a first frame supported off the floor by a high-low mechanism and a second frame slidably mounted on the first frame. A mattress frame, having a head section, seat section, and leg section which includes thigh and foot sections, is supported on the second frame with the seat section rigidly attached to the second frame. An actuating mechanism is provided for pivoting the head section to permit the patient to be moved from a prone position to a sitting position and vice versa, while at the same time moving the second frame and the mattress frame towards or away from the headboard of the bed, to thereby keep the patient's



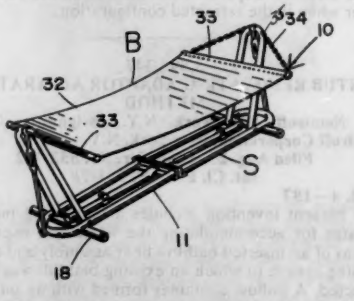
head and shoulders at substantially the same horizontal distance from the end of the bed.

3,593,351
PATIENT TRANSFER DEVICE
Benjamin A. Dove, 7521 McWhorter Place, Apt. 203, Annandale, Va.
Filed Aug. 14, 1969, Ser. No. 850,061
Int. Cl. A61g *7/08*
U.S. Cl. 5—81 **5 Claims**



A patient transfer device comprising a frame and a substantially planar table surface for the frame; a movable web supported on the table surface substantially flush therewith and extending from one side of the table surface to the other side of the table surface and a device for moving the web across the table surface from one side to the other.

3,593,352
COLLAPSIBLE SELF-SUPPORTING HAMMOCK
Harry J. Britt, 157 N. E. 68th Terrace, Miami, Fla.
Filed Jan. 30, 1969, Ser. No. 795,178
Int. Cl. A45f *3/24*
U.S. Cl. 5—127 **1 Claim**



The hammock frame is comprised of bent stock tubular members and angle iron members welded together to provide

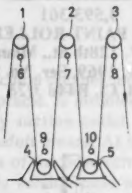
a base structure comprising end-to-end hinged base members to the outer ends of which are swingably journaled hammock support members. The hammock support members are foldable against their respective base members and the base members are foldable against themselves to provide a doubly folded compact unit. When erected, the central part of the base structure is somewhat elevated above the support floor to allow for flexing and resultant resilient inward yielding of the hammock support members.

3,593,353

WASHING OF A CONTAMINATED GUIDEROLL AND PREVENTION THEREFROM IN CLOTH TREATMENTS

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama-ken, Japan, assignors to Sando Iron Works Company Limited, Wakayama-ken, Japan

Filed May 16, 1967, Ser. No. 638,795
Claims priority, application Japan, May 23, 1966, Nov. 22, 1966, Nov. 7, 1966, 41/32873; 41/76606; 41/102720
Int. Cl. F26b *13/08*
U.S. Cl. 8—147 **5 Claims**



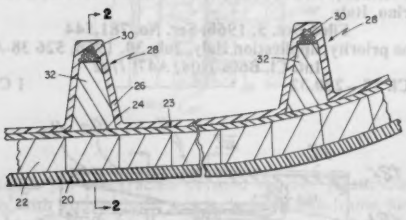
A method of cleaning the surfaces of guide rolls used in treating and processing cloth comprised of the step of passing a strip of material soaked in a cleaning fluid, such as water, in a continuous path over and in contact with the guide rolls. The method is preferably performed by attaching the strip of material to the cloth being processed and continuously passing it through the guide rolls following the cloth to remove any contamination that might have been accumulated on the rolls during processing. In the passage over the rolls, which are preferably reversed during the cleaning operation, the strip of material is squeezed against the rolls and the cleaning fluid assists in the removal of contaminants as the cloth wipes the roll clean.

3,593,354

BOAT HULL CONSTRUCTION

John Henry Carter, Weston, Mass., assignor to Aeromarine Corporation, Weston, Mass.

Filed Aug. 4, 1969, Ser. No. 847,031
Int. Cl. B63b *5/02*
U.S. Cl. 9—6 **4 Claims**



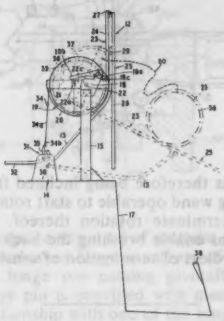
A sandwich construction for a boat hull incorporating integrally molded ribs having high strength at points remote from the outer hull surface and thereby providing a large structural moment resistant to distortion and failure under load or impact, lightweight for a given strength, and economy of fabrication.

3,593,355

CRADLE DEVICE FOR A LIFE RAFT OR LIKE DINGHY

Richard Edward Husband, Hadrian Way, Southampton, England, assignor to Husband's Shipyards Limited, Marchwood, Southampton, England

Filed May 1, 1969, Ser. No. 820,819
Int. Cl. B63b *23/28*
U.S. Cl. 9—31 **8 Claims**



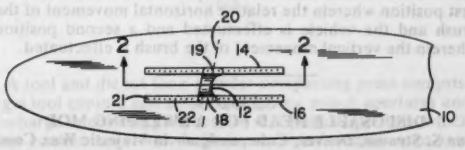
A device for storing and launching a life raft or similar device, the device having supporting means in which a raft-supporting cradle is rotatively mounted, a chute down which the raft moves when discharged by the tilting movement of the cradle, the chute including an inboard portion rigidly secured to the cradle, and an outboard portion dependent from hinge means located at the upper end of the inboard portion. A rigid link member has one end pivotally connected to the supporting means and its opposite end connected to the outboard portion, the arrangement of the inboard and outboard portions and the link member being such that when the cradle is moved from a storage position to a discharge position, the outboard portion is pivoted outwardly until the discharge position is reached at which time the inboard and outboard portions are longitudinally aligned and form the chute down which the life raft, removed from the cradle, freely descends.

3,593,356

SURFBOARD CONTROL DEVICE

Gene N. Schmalfeldt, 3509 Riviera Drive, San Diego, Calif.

Filed Mar. 12, 1969, Ser. No. 806,365
Int. Cl. A63c *15/06*
U.S. Cl. 9—310 E **7 Claims**



A surfboard control device comprising a foot stirrup that is secured to the upper surface of a surfboard along its longitudinal axis, which stirrup holds the foot of the surfer to the surfboard during surfing and aids in turning the surfboard by allowing the surfer to exert upward force on the board through cooperation with the surfer's other foot, and aids both experienced surfers and beginning surfers in accurately positioning their feet on the surfboard, which position is established by trial and error and identified on a scale.

3,593,357

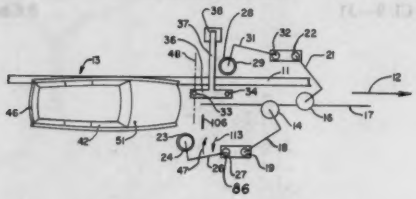
SEPARATELY DRIVEN WINDOW AND SIDE BRUSHES ON COMMON FRAME

Dale R. Oldham, Phoenix, Ariz., assignor to Earl Dallas Smith, Phoenix, Ariz.

Filed Feb. 6, 1968, Ser. No. 703,405
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 **8 Claims**

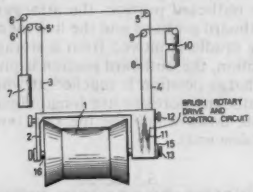
Vehicle-cleaning brush arrangement of a body and fender side brush rotatable by one hydraulic motor on a first axis on

a brush frame, and a window brush rotatable on a second axis by a second motor on the brush frame. A vertical pivot for the brush frame enabling swinging thereof in a horizontal arc for body brush action on portions below the vehicle "belt line," and independent window brush action on portions above the belt line, the window brush being above the body



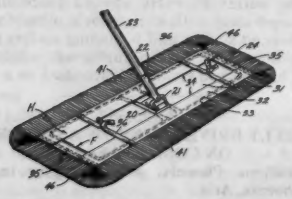
brush and the axis therefore being inclined from vertical. A windshield sensing wand operable to start rotation of the window brush and terminate rotation thereof. Window brush load sensing means enable brushing the back window of station wagons regardless of termination of sensing wand actuation.

3,593,358
SWITCH CONTROL MECHANISM FOR A CARWASH INSTALLATION
Josef Hofmann, Oberschurer Str. 5, 8752 Krombach, Germany
Filed Feb. 28, 1969, Ser. No. 803,364
Claims priority, application Germany, Feb. 29, 1968, P 16 80 307.9
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 **6 Claims**



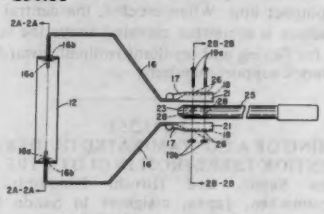
In a carwash installation, a roof brush is suspended on a rope for vertical movement in relation to a vehicle, and the brush and vehicle are movable in a horizontal direction in relation to each other. An actuating lever responsive to the movements of the brush and the rope actuates a switch into a first position wherein the relative horizontal movement of the brush and the vehicle is effectuated and a second position wherein the vertical movement of the brush is effectuated.

3,593,359
DISPOSABLE HEAD FOR A SWEEPING MOP
Don S. Strauss, Denver, Colo., assignor to Majestic Wax Company, Denver, Colo.
Filed May 29, 1969, Ser. No. 829,029
Int. Cl. A47l *13/20*
U.S. Cl. 15—229 **7 Claims**



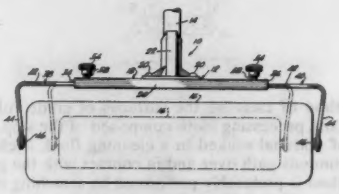
A disposable mophead for a sweeping mop having a paper-plastic backing to which the strands are sewn as a fringe on each side of the backing, at the flat undersurface of the backing, to lie flatly upon a floor when the mop is in use.

3,593,360
PAINT APPLICATOR
George P. Coughlin, 201 N.E. Alki Road, Vancouver, Wash.
Filed June 18, 1969, Ser. No. 834,362
Int. Cl. B44d *3/28*
U.S. Cl. 15—230.11 **1 Claim**



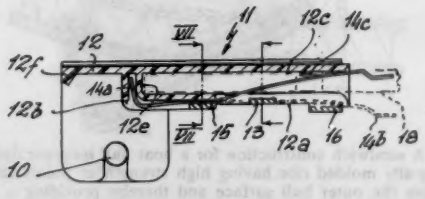
A paint roller, with drip guard for painting ceilings, which includes a two-piece split handle design for the roller secured together by removable fasteners. The drip guard is attached to the respective arms of the roller by slotted lugs and is free turning so as to hang directly beneath the roller when in use. The roller handle is recessed at its lower end to receive an extension handle.

3,593,361
ADJUSTABLE PAINT-ROLLER HOLDER
David I. Welt, 7480 S.W. 128th St., Miami, Fla.
Filed June 9, 1969, Ser. No. 831,503
Int. Cl. B44d *3/28*
U.S. Cl. 15—230.11 **6 Claims**



An adjustable paint roller holder for removably supporting relatively large rollers, i.e., 2 feet long and 3 to 4 inches in diameter, which includes a cross frame having a hollow of rectangular cross section defining elongated rectangular trackways for receiving extendable support arms having opposed coaxial trunnions extending from the ends and between which an enlarged paint roller is journaled, this construction being adapted for use in painting floors, walls and ceiling where a two-handed manipulation is feasible and large areas are to be painted, and more particularly where different sized rollers are necessary and can be readily interchanged for different uses.

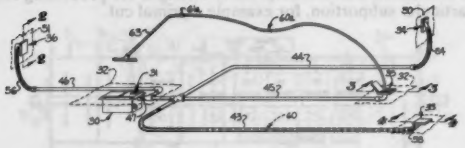
3,593,362
CONNECTING MEANS FOR WINDSHIELD WIPER BLADE
Dario Arman, Strada Comunale Druento-Venaria, Druento, Torino, Italy
Filed Dec. 5, 1968, Ser. No. 781,544
Claims priority, application Italy, July 30, 1968, 526 38-A/68
Int. Cl. B60s *1/04*; **A47l** *1/02*
U.S. Cl. 15—250.32 **1 Claim**



A plastic, box-shaped element, attached to an oscillating, U-shaped support, releasably holds an automotive wiper

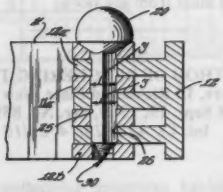
blade by means of a spring that has a first portion captured within the box-shaped element and a second or toothed portion that is in engagement with the wiper blade.

3,593,363
VACUUM CLEANING SYSTEM WITH HOSE PLUG-IN AND HOSE RETRACTING OUTLETS
James C. Hamrick, Matthews, N.C., assignor to J. L. Products Incorporated, Matthews, N.C.
Filed Jan. 2, 1969, Ser. No. 788,376
Int. Cl. A47l 5/38
U.S. Cl. 15—315 11 Claims



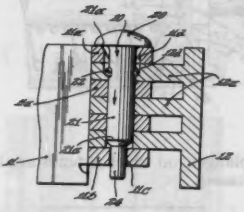
A self-contained vacuum cleaner unit, having its own plug-in suction outlet receptacle, is installed in a building and has a plurality of auxiliary suction outlet receptacles connected thereto by suction conduit means. At least one of the auxiliary outlet receptacles is of the hose-retracting type, and a specially designed flexible suction hose is adapted for selective connection to the plug-in and auxiliary outlet receptacles as well as being adapted to be stored within the retracting-type auxiliary outlet receptacle and a corresponding suction conduit extending from the latter receptacle. Various forms of foot-end adapters are provided to facilitate such selective connection of the flexible hose to the plug-in and retracting types of suction outlet receptacles.

3,593,364
SPECTACLE HINGE PIN
Philip J. Liautaud, Hoffman Estates, Ill., assignor to Fendall Company, Chicago, Ill.
Filed June 3, 1969, Ser. No. 829,866
Int. Cl. E05d 5/10
U.S. Cl. 16—168 4 Claims



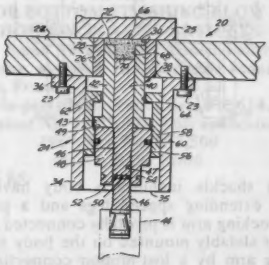
A hinge pin constructed of solid molded plastic for assembly with conventional spectacle temple-to-frame hinges. A plastic hinge pin is provided having a peripheral interference fit with respect to the hinge plate pivot apertures and integral yieldable means to retain it in position therein. One form of the invention provides a pin having a varying peripheral diameter with a maximum diameter in excess of and in interference fit with the inner surface of the hinge barrel.

3,593,365
SPECTACLE HINGE
Paul D. Amundsen, Wonder Lake, Ill., assignor to Fendall Company, Chicago, Ill.
Filed June 3, 1969, Ser. No. 830,060
Int. Cl. E05d 5/10
U.S. Cl. 16—169 2 Claims



A spectacle hinge constructed of metallic components and incorporating interleaved hinge members of a relatively soft material and a hinge pin passing pivotally therebetween wherein the hinge pin is provided with means providing an interference relationship with one of the hinge members in a manner preventing inadvertent hinge disassembly following a forced insertion of the pin.

3,593,366
MULTIPLE PUNCH TOOL SET FOR POWDER COMPACTING PRESS
Joseph E. Smith, Birmingham, Mich., assignor to Wolverine-Pentronix, Inc., Lincoln Park, Mich.
Filed Dec. 11, 1968, Ser. No. 782,918
Int. Cl. B29c 3/00
U.S. Cl. 18—16.7 22 Claims

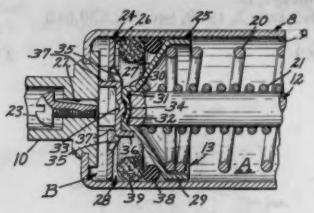


A tool and die set for a powder-compacting press comprising a tool capsule and a die plate having punch apertures and discharge apertures, punches for said punch apertures which may contain core rods held immovable in relation to said punches and which are lockable in position so as to be flush with the surface of said die plate and in which said punches are telescopically arranged dual punches for movement relative to each other to form shaped articles.

3,593,367
PNEUMATIC DOOR CLOSER
Russell W. Waldo, St. Paul, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.
Filed Aug. 15, 1969, Ser. No. 850,578
Int. Cl. E05f 3/00
U.S. Cl. 16—66 7 Claims

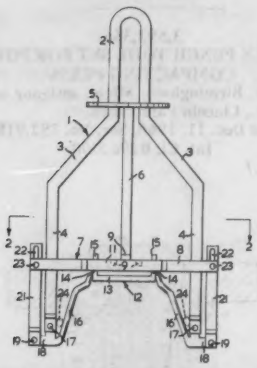
Piston means in a pneumatic door closer and including a body structure defining a radially outwardly opening annular channel having axially spaced sidewalls, a sealing ring movable axially toward and away from one of the sidewalls, and a porous lubricating ring disposed between the other of the sidewalls and the sealing ring. Both rings frictionally engage the cylindrical surface of an elongated casing in which the

piston means is axially movable. The piston means includes a pair of cooperating elements welded together and to the



inner end of a plunger rod which extends axially outwardly of one end of the casing.

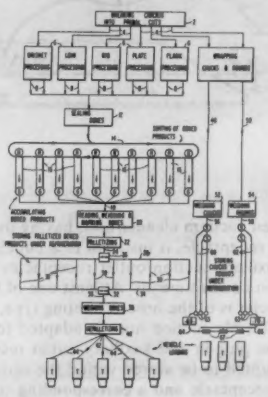
3,593,368
AUTOMATIC POULTRY SHACKLE
John Henry Cox, R. R. #3, Lambeth, Ontario, Canada
Filed Oct. 27, 1969, Ser. No. 869,458
Claims priority, application Canada, Oct. 28, 1968, 033,711
Int. Cl. A22c *21/00*
U.S. Cl. 17—44.1 **5 Claims**



A poultry shackle includes a body having a pair of downwardly extending spaced legs and a pair of locking arms. Each locking arm is pivotally connected to the body. A crossmember slidably mounted on the body is connected to each locking arm by a lost-motion connection. The crossmember has a latch operable to maintain the locking arms in an upwardly extending closed position. Poultry legs can be wedged between the locking arms and the legs of the shackle. The crossmember is upwardly movable relative to the body to move the latch clear of the locking arms and, after taking up the lost motion, to cause angular movement of the locking arms away from the associated legs to an open position such that poultry is released from the shackle.

3,593,369
METHOD OF BREAKING ANIMAL CARCASSES AND HANDLING MEAT PRODUCTS
A. D. Anderson, Sioux City; Walter E. Lauridsen, South Sioux City, and Charles L. Overstreet, Sioux City, all of, Iowa, assignors to Iowa Beef Processors, Inc.
Filed Feb. 19, 1968, Ser. No. 706,557
Int. Cl. A22c *17/00*
U.S. Cl. 17—46 **44 Claims**

An integrated facility for breaking dressed animal carcasses includes a continuous flow of the carcasses and their subdivisions through a series of processing areas where the carcasses are broken into primal cuts, the primal cuts are further divided, boned and trimmed along processing lines designated for particular cuts, the secondary cuts thus produced are then trimmed and boned as necessary, packaged and sorted according to their weight. Groups of the secondary cuts are placed in boxes which carry machine-readable markings which indicate the box contents. The filled receptacles are carried by a common conveyor to an area where they are sorted into groups according to the machine-readable markings, palletized by groups and placed on unidirectional refrigerated storage conveyors. Orders for products are filled by discharging the pallets from their respective storage conveyors, depalletizing the goods and routing the boxes to designated transport vehicles. A constant inventory of boxed products is maintained by automatically reading the markings on the boxes and weighing the boxes both before and after they pass through the storage conveyors. Large bodies of meat are advanced through a series of stations where subportions thereof are removed and deposited on conveyorized lines which are provided with work stations and tables specially arranged for processing the particular subportion, for example a primal cut.

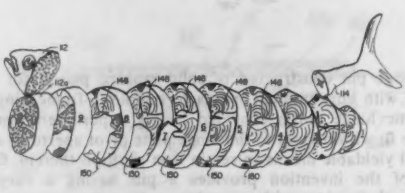


Suspended carcasses are broken into primal cuts by moving them through a series of stations where portions are removed. Large portions such as forequarters of beef are transferred to a conveyor which suspends them from a pair of tongs. Beef chucks may be supported on a looped cord which passes therethrough as they are severed from the carcass. Other portions may be removed by cutting them from the carcass and permitting them to fall at the head of a conveyor which has stations therealong for cutting, trimming, packaging and weighing meat.

Tongs for suspending the meat have a pair of opposed relatively movable plates which engage opposite sides of the meat.

A method and apparatus for releasing portions of meat suspended from cords which are engaged on hooks involves movement of a pair of members toward and beyond each other, whereby one member acts as an abutment to hold the hook in a desired orientation and the other member pushes the cord and the meat from the hook.

3,593,370
METHOD OF BUTCHERING TUNA
James M. Lapeyre, 13 Richmond Place, New Orleans, La.
Filed Sept. 19, 1969, Ser. No. 859,408
Int. Cl. A22c *25/14, 25/18*
U.S. Cl. 17—52 **10 Claims**



Method of butchering frozen whole fish including the subdivision of the whole fish into a plurality of cross sections

thereof and subsequently subdividing the cross sections into frozen segments the junctures between which are along lines which are general parallel to the longitudinal axis of the fish and to the skeletal structure thereof.

3,593,371

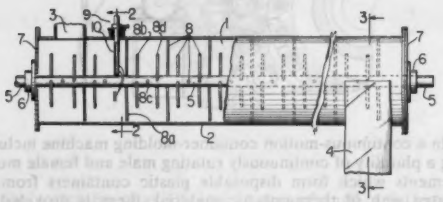
APPARATUS FOR PRODUCING IMPROVED PELLETS OF A POWDER

Richard E. Driscoll, Monroe, La., assignor to Cities Service Company

Division of Ser. No. 705,811, Feb. 15, 1968, Pat. No. 3,535,412. Filed Nov. 28, 1968, Ser. No. 880,444

Int. Cl. B29c *23/00*; B29b *1/02*; R01j *2/10*

U.S. Cl. 18—1 B 15 Claims



A powdered material is transformed into generally spherical pellets so that the bulk density of the material is increased while making it nicer to handle and cheaper to transport. Generally a liquid pelletizing medium is uniformly distributed throughout the cross section of a mass of the powder as it is subjected to vigorous mechanical agitation while advancing through an elongated zone of agitation.

When pelletizing carbon blacks, pellets may be produced which have novel physical characteristics as regards the mass strength to crushing strength ratio of the pellets.

3,593,372

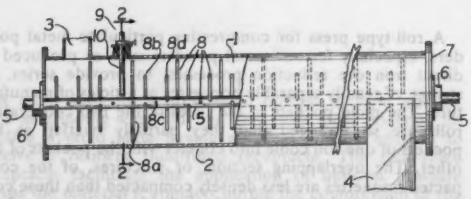
WET-PELLETIZING APPARATUS

Richard E. Driscoll, Monroe, La., assignor to Cities Service Company, New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,031

Int. Cl. B29b *1/02*

U.S. Cl. 18—1 B 5 Claims



Improved wet-pelletizing apparatus having an elongated conduit wherein a bed of wetted powder particles is agitated and tumbled to form pellets. The agitation is accomplished by rotating a coaxially extending shaft which carries a multiplicity of elongated members arranged in longitudinally spaced rows along the shaft and which extend outwardly therefrom toward the wall of the conduit. A stream of liquid-pelletizing medium is injected longitudinally into the conduit from an injector oriented to provide impact with a primary row of the members in which the number of members exceeds that in subsequent rows. Better atomization, and more quick and uniform distribution of the liquid throughout the powder bed, is thereby accomplished.

3,593,373

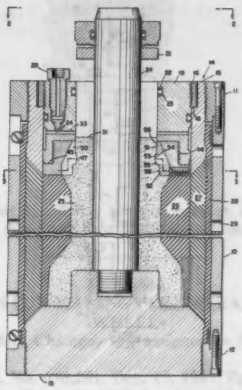
MOLDING APPARATUS

David G. Loomis, 217 Gypsy Lane, Wynnewood, Pa.

Continuation-in-part of application Ser. No. 513,440, Dec. 13, 1965, now abandoned. This application Sept. 26, 1968, Ser. No. 776,844

Int. Cl. B30b *5/02*, *11/00*

U.S. Cl. 18—5 HA 3 Claims



Apparatus for dry pressing and isostatic pressing of ceramic powder to form pipe wherein a groove is provided near a pipe end by means of arcuate, metallic segments which are hydraulically pressed into the powder by flexible tooling. The adjacent portion of the pipe is formed by a punch.

3,593,374

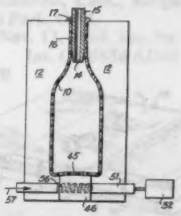
DEVICE FOR BOTTOM-FINISHING BLOW MOLDED HOLLOW PLASTIC ARTICLES

Michel Siard, Saint Adresse, and Daniel Pellerin, le Havre, both of, France, assignors to Compagnie Francaise De Raffinage, Paris, France

Continuation-in-part of application Ser. No. 614,356, Feb. 6, 1967, now Patent No. 3,487,501. This application Sept. 12, 1969, Ser. No. 857,500

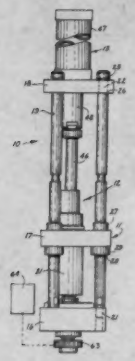
Int. Cl. B29c *23/00*

U.S. Cl. 18—5 BS 3 Claims



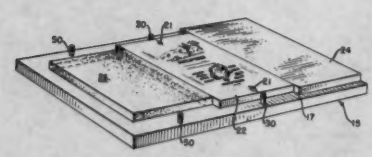
When hollow plastic articles such as bottles are blow molded in molds having a plurality of seperable parts, an excess "tail" or "flash" is produced, particularly at the bottom of the bottle, by plastic materials beyond the extent of the mold cavity, which excess must be cut off or removed in finishing the articles. Here such flash removal at the bottom of the article is accomplished without hand work and while the article is still in the mold, by pinching the "flash" between a reciprocally movable and a stationary serrated surface and shearing or tearing the excess material away from the article upon movement of one serrated surface with respect to the other.

3,593,375
PLASTICIZING AND WORKING MACHINE
James W. Hendry, Helena, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 11, 1968, Ser. No. 766,926
Int. Cl. B29f 3/00
U.S. Cl. 18—12 14 Claims



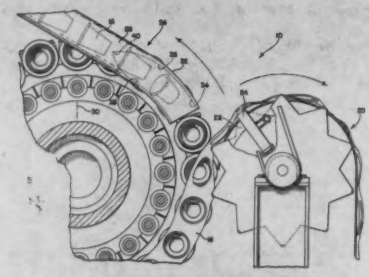
A plasticizing machine including therein a rotatable plasticizing spinner. The spinner includes a tapered portion against which plastic material is urged under a positive pressure to effect an initial heating thereof. The base of the tapered portion is connected to a working portion which comprises an elongated cylindrical member having a plurality of axially spaced, annular ridges thereon. The working portion is surrounded by a substantially cylindrical housing so as to define a passage therebetween having a plurality of axially spaced gaps of small radial extent whereby the material passing through the gaps is folded and mixed.

3,593,376
APPARATUS FOR MAKING MULTIPLE-IMAGE ELECTROTYPE MOLDS
Laurence J. Kisker, Lancaster, and William G. Mathewson, Tonawanda, both of, N.Y., assignors to J.W. Clement Company, Depew, N.Y.
Filed Apr. 4, 1968, Ser. No. 718,712
Int. Cl. B29c 3/00
U.S. Cl. 18—16 R 3 Claims



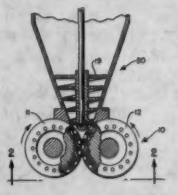
A method and apparatus for preparing multi-image matrices for printing plates from photoengravings or the like in the black-white and multicolor printing industries; featuring use of a thermoplastic mold sheet impressed successively at adjacent areas thereof against a single engraving, to produce a multi-image mold. The apparatus includes mold register guide-forming means functioning automatically to precisely register the mold sheet as it is shifted from one impression operation to another. Also, the apparatus features means for insulating each previously made image impression against resoftening and/or deformation incidental to subsequent processing of the mold sheet in the mold press.

3,593,377
CONTAINER REMOVAL APPARATUS
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.
Filed Nov. 12, 1969, Ser. No. 875,881
Int. Cl. B29c 17/00
U.S. Cl. 18—20 RR 5 Claims



In a continuous-motion container-molding machine including a plurality of continuously rotating male and female mold elements which form disposable plastic containers from a heated web of thermoplastic material, there is provided a hollow container ejector tube which is configured and designed relative to the female mold elements to permit the rapid entry of containers from the female mold elements and transfer of the containers to a collecting station.

3,593,378
BRIQUETTING PRESS
William J. Metrailer, Baton Rouge, La., assignor to Esso Research and Engineering Company
Filed Sept. 3, 1968, Ser. No. 756,868
Int. Cl. B29c 3/02
U.S. Cl. 18—21 4 Claims

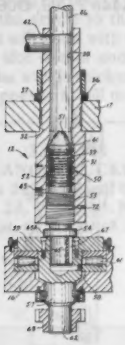


A roll-type press for compressing particulate metal powders, especially ferrous metal powders such as produced in direct iron ore reduction processes, to provide series, or strings, of readily separable briquettes as articles of manufacture. The mold pockets in the faces of the two cooperating rolls are so arranged that they partially overlap as the pockets of one roll come into contact with the pockets of the other. The overlapping section, or junctures, of the compacted briquettes are less densely compacted than those conventionally produced so that the individual briquettes of the issuing series can be readily broken apart. Moreover, forces are generated which aid in the release of the briquettes from the mold pockets.

3,593,379
PLASTICIZING AND WORKING MACHINE
James W. Hendry, Helena, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Continuation-in-part of application Ser. No. 766,926, Oct. 11, 1968. This application Apr. 10, 1969, Ser. No. 814,898
Int. Cl. B29f 1/00
U.S. Cl. 18—30 SR 17 Claims

A plasticizing machine including therein a rotatable plasticizing spinner. The plasticizing spinner includes a working portion which comprises an elongated cylindrical

member having a plurality of axially spaced, annular ridges thereon. The working portion is surrounded by a substantially cylindrical housing to define a passage therebetween



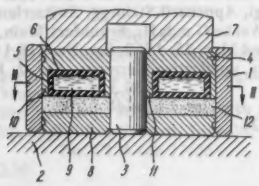
having a plurality of axially spaced gaps of small radial extent whereby plastic material passing through the gaps is folded and mixed.

3,593,380

MOLDING PLATE OF A PRESS MOLD FOR MAKING ARTICLES OF BLANKS OF LOOSE MATERIALS

Sergei Georgievich Voronov, Vyborgskaya naberezhnaya, 13, kv. 13, Leningrad, and Vladimir Dmitrievich Yashin, Leningradskoi oblasti, ulitsa, Narvskaya 14, Luga, both of, U.S.S.R.

Filed Dec. 12, 1968, Ser. No. 783,225
Int. Cl. B26b *19/38*
U.S. Cl. 18—34 R **4 Claims**



A mold plate for a press mold utilized to form articles, such as grinding wheels or the like, from loose material, including a mold plate having a recess portion adapted to receive a resilient fluid-filled receptacle. The fluid-filled receptacle facilitates the application of uniform pressure across the material it contacts during the compression of the latter.

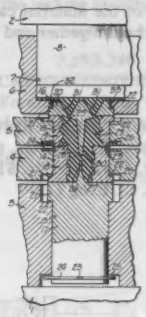
3,593,381

MULTIPLE-CAVITY MOLD FOR PRODUCING FLASH-FREE PARTS

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Ltd., Wilmington, Del.

Filed Apr. 10, 1968, Ser. No. 720,186
Int. Cl. B29c *3/04*
U.S. Cl. 18—36 **3 Claims**

A means wherein a plurality of mold units, each comprising two or more stacked mold bodies, each of which is held and positioned by a carrier plate in coaxial relation to the other mold bodies. The carrier plates permitting limited axial movement of the mold bodies, thereby to permit stacking of the mold bodies in abutting relation irrespective of difference in lengths of the mold units due to manufacturing tolerance. Each uppermost mold body being exposed to the molding



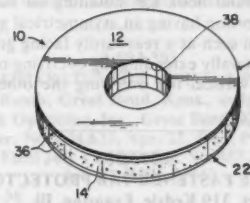
material so that the force thereof presses all of the mold bodies of each mold unit into flash free relations.

3,593,382

APPARATUS FOR MAKING PERIPHERAL GRINDING WHEEL

Harold C. Miller, Chicago, Ill., assignor to Super-Cut, Inc., Chicago, Ill.

Division of Ser. No. 690,201, Dec. 13, 1967, Pat. No. 3,522,676
Filed Sept. 16, 1969, Ser. No. 858,473
Int. Cl. B29c *3/00*
U.S. Cl. 18—42R **5 Claims**



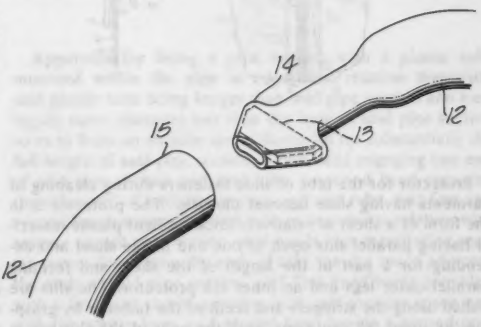
Apparatus for making an internally reinforced peripheral grinding wheel and by means of which radial pressure is applied outwardly to a mold mixture confined within an annular ring in the presence of heat.

3,593,383

HEAT-SHRINKABLE CABLE TIE

Roger H. Ellis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

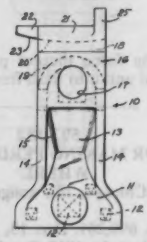
Filed Nov. 13, 1968, Ser. No. 775,296
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **5 Claims**



A tie for use with cables, wire bundles, or the like the differing sizes fabricated from heat-recoverable tubing which is

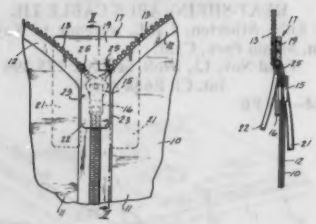
expanded in both the diametrical and longitudinal directions. An insert is positioned in one end of the tubing and this end of the tubing is telescoped within the other end. Upon recovery, the shrinkage of the material causes both the two ends of the tubing to be held together and the wire bundle to be secured.

3,593,384
GUY HOOK FOR UTILITY LINE POLES
Owen R. Huggins, 136 West Ave., Darien, Colo.
Filed Apr. 7, 1969, Ser. No. 813,931
Int. Cl. F16g *11/00*
U.S. Cl. 24—115 7 Claims



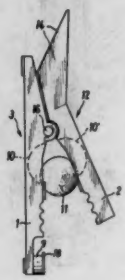
A guy and strand hook for mounting on utility poles including a hub portion having an asymmetrical guy wire loop-retaining portion such as a rearwardly facing groove channel or seat, and a laterally extending lug overlying one end of the channel and a vertical lug overlying the other end of the channel.

3,593,385
SLIDE FASTENER TAB PROTECTOR
Harry S. Shubart, 319 Kedzie, Evanston, Ill.
Filed Jan. 21, 1970, Ser. No. 4,694
Int. Cl. A44b *19/26*
U.S. Cl. 24—205.15 10 Claims



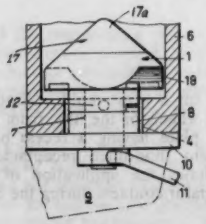
Protector for the tabs of slide fasteners during cleaning of garments having slide fastener closures. The protector is in the form of a sheet of relatively thick resilient plastic material having parallel slits open to one end of the sheet and extending for a part of the length of the sheet and forming parallel outer legs and an inner tab protector. The slits are pulled along the stringers and teeth of the fastener by grasping the inner tab protector, until the ends of the slits are in engagement with the teeth of the fastener, with the legs on the inner side of the garment and fastener and the inner tab protector extending over and protecting the tab of the fastener.

3,593,386
CLAMP
August Hug, 29 Zurcherstrasse, St. Gallen, Switzerland
Filed Dec. 1, 1969, Ser. No. 881,138
Claims priority, application Switzerland, Dec. 5, 1968, 18,326
Int. Cl. A44b *21/00*; D06f *55/02*
U.S. Cl. 24—137 6 Claims



A clamp having two hingedly connected clamp portions each provided with a clamp jaw urged into clamping position by spring means is particularly used as a clothes hanger. The two clamp portions are provided with oppositely arranged hemispherical recesses adapted to contain a spherical locking body when the clamp is in closed position. When the clamp is opened by hand the spherical locking body moves out of said hemispherical recesses, preferably by gravity, into two opposite recesses of smaller depth to hold the clamp jaws in open position. When introducing a piece of clothing or other article between the open clamp jaws, this article is pushed against the locking sphere and moves this latter back to inactive position, while said spring means close the jaws upon the article.

3,593,387
ARTICLE-SECURING DEVICE
Theodor Georgi, Appenzell-Steinegg, Switzerland, assignor to Firma Jost-Werke G.m.b.H., Frankfurt/Main, Germany
Filed Mar. 25, 1969, Ser. No. 810,117
Claims priority, application Germany, Apr. 2, 1968, P 17 55 130.3
Int. Cl. A44b *17/00*
U.S. Cl. 24—221 6 Claims



A device for holding a container or the like to a mounting base of a supporting base, located within another container, for example, includes a bolt member which is mounted for rotation on the base plate and which may be operated by a hand lever extending outwardly therefrom. The upper end of the bolt is provided with a widened head portion of oblong configuration having a long end which is normally oriented so that it will align with a long end of a socket or receiving member which is defined at the lower end of the container or article to be anchored. The head portion advantageously comprises two parts including an upper head and a lower disc shaped part having end faces which are congruent to the underside of the upper part. The lower part is advantageously

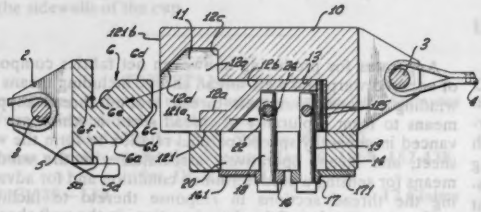
rotatably mounted on the pin but includes a surface which frictionally engages the pin. Rotation of the hand lever after the oblong outline of the head portion is aligned with the receiving slot of the socket of the article to be fixed will pivot the bolt with the oblong head within the socket receiving portion so that the oblong portion extends across the receiving slot and anchors the article to the supporting base. The lower part of the head will pivot with the bolt only if the wall bordering the socket slot is thin enough so that it will not block its pivoting. If the wall is thicker it will block the lower part so that only the upper part will move with the bolt.

3,593,388

CANOPY BUCKLE

Jan R. Coyle, P.O. Box 297, Milford, Utah

Filed Apr. 22, 1968, Ser. No. 722,969
Int. Cl. A44b 11/25
U.S. Cl. 24—230 18 Claims



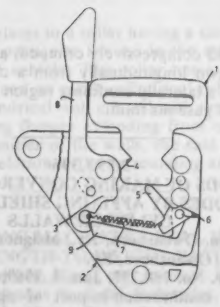
A failure safe buckle in which a lug of a male buckle part is captured in a recess of a female buckle part by a latch slide, the latch slide being releasably locked in a position overlying the recess and engaged with the lug. Such a buckle in which the lock mechanism includes relatively movable parts biased to locking positions to lock the latch slide against movement, the relatively movable parts requiring simultaneous opposite movement to permit shifting of the latch slide to a position releasing the lug.

3,593,389

BUCKLES FOR SAFETY SEAT BELTS

Harry M. Nygren, Monsteras, Sweden, assignor to AB Industriejadrar, Monsteras, Sweden

Filed June 24, 1968, Ser. No. 739,468
Claims priority, application Sweden, June 28, 1967, 9378/67
Int. Cl. A44b 11/25
U.S. Cl. 24—230 2 Claims



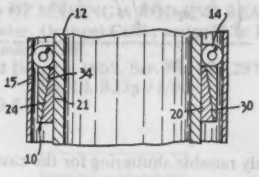
A buckle for safety seat belts in vehicles comprises a locking tongue and a locking housing. The housing has a spring-loaded operating arm with a locking member which is arranged to engage the locking tongue in the position thereof when inserted in the locking housing. Further, the locking housing has a spring-loaded cam which tends to push the locking tongue out of the housing from the position therein. The cam coacts with a latch which blocks the operating arm in the open position of the buckle. The cam, however, is adapted to release the latch when the locking tongue occupies its position in the locking housing.

3,593,390

SELF-LOCKING WEDGE RING SUPPORT

Michel Pettigrew, Forest Hall, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed June 3, 1968, Ser. No. 734,034
Int. Cl. F16d 1/06
U.S. Cl. 24—263 2 Claims



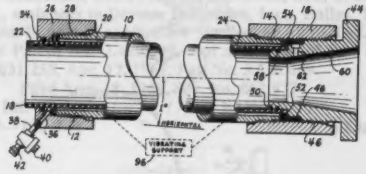
A self-locking wedge ring assembly supporting a spacer element on a tube or on an inner one of a pair of concentric tubes such as the pressure tube of a nuclear reactor. The wedge ring assembly includes inner and outer rings having mating tapered surfaces, the inner ring being split to allow for diametrical variations of the pressure tube.

3,593,391

APPARATUS FOR LINING A PIPE

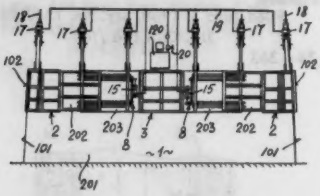
Benjamin I. Routh, Great Bend, Kans., assignor to Rice Engineering & Operating, Inc., Great Bend, Kans.

Division of Ser. No. 544,623, Apr. 22, 1966, Pat. No. 3,482,007
Filed July 17, 1969, Ser. No. 857,256
Int. Cl. B28b 21/42
U.S. Cl. 25—38 5 Claims



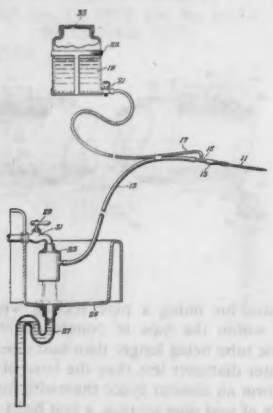
Apparatus for lining a pipe section with a plastic tube mounted within the pipe in concentric relation therewith, said plastic tube being longer than said pipe section and having an outer diameter less than the bore of said pipe section so as to form an annular space therewith for substantially the full length of said pipe section, a first head engaging one end of said pipe section and said tube, a second head engaging the other end of said pipe section and said tube, said first and second heads supporting said tube in concentric relation with respect to said pipe section, said heads also constituting sealing means for closing the ends of said annular space adjacent the ends of said pipe section, said first head being provided with a first port communicating with said annular space and with the atmosphere, said second head having a second port communicating with said annular space and the atmosphere, and means for introducing a cement slurry under pressure into said annular space through one of said ports so as to fill said annular space.

3,593,392
CONCRETE CASTING SHUTTERING
Guido Lambertini, 112, Via Saragozza, Bologna, Italy
Filed Oct. 7, 1968, Ser. No. 765,492
Claims priority, application Italy, Oct. 10, 1967, July 31, 1968, 814223;7210 A/68
Int. Cl. B28b 7/02
U.S. Cl. 25—131 8 Claims



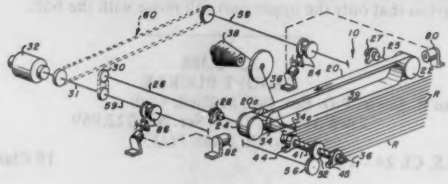
Successively raisable shuttering for the casting of upwardly or downwardly tapering concrete structures, comprising two mutually opposed and horizontally displaceable form portions for forming the tapering surfaces of the structure, which are interconnected by a mechanism coupled to a raising system for the shuttering so that the form portions are displaced inwardly or outwardly by a predetermined amount during each raising step of the raising system.

3,593,393
METHOD OF TREATING WASTE MATERIAL
George G. Ware, 609 S. Lake St., Forth Worth, Tex.
Filed Jan. 15, 1969, Ser. No. 791,264
Int. Cl. A01n 1/00
U.S. Cl. 27—24 R 4 Claims



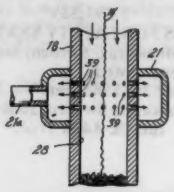
This specification discloses method and apparatus for treating waste material; such as, that from a dead body containing living organisms that are likely to be dangerous; characterized by injecting a substance into a closed conduit near the point where the waste material is removed from the body and circulating the admixture of the toxic substance and the waste material through a closed conduit for a sufficient period for the toxic substance to kill the living organisms. Thereafter, the admixture is discharged into a waste disposal means; such as, a sink and its drain line.

3,593,394
APPARATUS HAVING IMPROVED CONTROL MEANS FOR PRODUCING NONWOVEN FABRICS
Milton M. Bolles, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed Nov. 5, 1969, Ser. No. 874,121
Int. Cl. D02g 3/00; D04h 3/02
U.S. Cl. 28—1 14 Claims



Apparatus for producing nonwoven net fabrics composed of adhered warp and weft thread sheets, including means for winding a continuous weft thread around thread support means to form a plurality of thread sections which are advanced in generally spaced parallel relation to form the weft sheet, and means operatively associated with the winding means for sensing a predetermined condition and for advancing the thread sections in response thereto to facilitate uniform positioning of the thread sections in the weft sheet.

3,593,395
STRAND TREATMENT
Robert K. Stanley, 620 Meadowvale Lane, Media, Pa.
Filed Apr. 28, 1969, Ser. No. 819,824
Int. Cl. D02g 1/12
U.S. Cl. 28—72.14 15 Claims

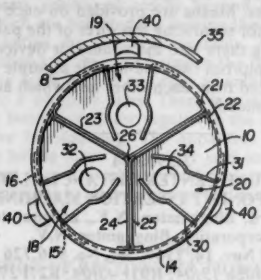


Textile strand compressively crimped, as by stuffer crimping, is withdrawn longitudinally from a compact accumulation thereof in a laterally confining region through a countercurrent flow of gaseous fluid.

3,593,396
METHODS OF MAKING CONVERGENCE CUP ELECTRODES BY AFFIXING SHIELDS TO INNER CYLINDER WALLS
Jay H. Johnson, Owensboro, Ky., assignor to Kentucky Electronics, Inc., Owensboro, Ky.
Division of Ser. No. 788,777, Jan. 3, 1969, Pat. No. 3,513,479, which is a continuation-in-part of application Ser. No. 633,822, Apr. 26, 1967, now Patent No. 3,441,769.
Filed Mar. 9, 1970, Ser. No. 17,756
Int. Cl. H01j 9/18, 9/36
U.S. Cl. 29—25.16 4 Claims

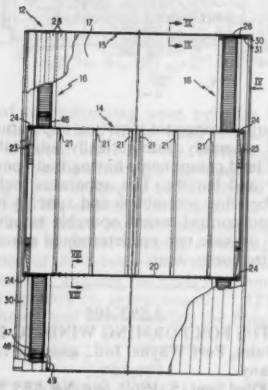
Methods are disclosed for making cylindrical cup electrodes for three-gun color picture tubes having internally mounted shield inserts of magnetic material affixed to the inner walls of the cup. The upper rim of the cup is kept intact and may be flanged outwards to improve roundness after

apertures are formed in the cup sidewalls. Apertures in the cup walls are confined to those required for magnetic pole



pieces extending into said cup comprising three pairs of slits in the sidewalls of the cup.

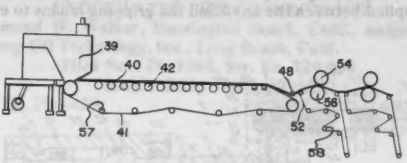
3,593,397
TEST STAND ROLLER
Jean Odier, Antony, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France
Filed May 13, 1969, Ser. No. 824,240
Claims priority, application France, May 20, 1968, 152 438
Int. Cl. B21b *31/08*
U.S. Cl. 29—130 **17 Claims**



The invention relates to a roller having a case preferably of metal intended in particular for use in the stationary testing of a self-propelled vehicle. This roller has a gastight enclosure, formed between an outer cylindrical rolling or bearing wall, an inner cylindrical wall coaxial with the first wall, and two annular sealing flanges extending from one wall to the other at the extremities of the walls, the said enclosure may be pressurized in relation to the surrounding atmosphere.

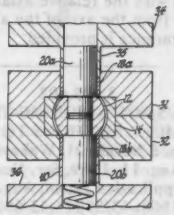
3,593,398
RELATIVELY LONG MACHINERY ROLL HAVING HIGH STRENGTH-TO-WEIGHT RATIO
Ralph A. Hess, Medfield, Mass., and James P. NcNamee, Pawtucket, R.I., assignors to S W Industries, Inc., Newton, Mass.
Filed Sept. 11, 1969, Ser. No. 857,186
Int. Cl. B21b *31/08*
U.S. Cl. 29—132 **14 Claims**

A machinery roll, particularly for use in papermaking machinery, has a mandrel, characteristically composed of a two-phase system having an external phase containing a synthetic polymeric matrix and an internal phase containing aligned continuous carbon fibers. The high tensile strength of the carbon fibers and the compatibility of the polymeric matrix therewith cooperate to permit the construction of



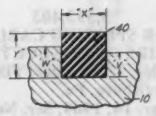
relatively long thin rolls which, for example in papermaking machines, enable wider construction and higher speed operation.

3,593,399
METHOD OF MAKING A ROD END BEARING
George I. Bannister, Orange, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Dec. 11, 1969, Ser. No. 884,297
Int. Cl. B23p *11/00*
U.S. Cl. 29—149.5 B **3 Claims**



A method for making spherical rod end bearings comprising pressing a right cylindrical bushing into a radially uniform semispherical clearance between a ball and a bearing retainer or banjo. A single or double bushing may be used. A new bushing may be used to eject an old one. The retainer is preferably provided with axially oriented annular flats adjacent the opposite ends thereof to lock the bushing into place.

3,593,400
METHOD OF FORMING A BUTTERFLY VALVE
Donald L. Geiselman, and Frederick T. Newell, both of Bradford, Pa., assignors to Dresser Industries, Inc.,, Dallas, Tex.
Continuation-in-part of application Ser. No. 604,090, Oct. 31, 1966, now Patent No. 3,420,500, and a division of Ser. No. 631,255, Apr. 17, 1967, Pat. No. 3,525,499.
Filed Aug. 18, 1969, Ser. No. 862,577
Int. Cl. B23p *15/26, 17/00*; B23k *19/00*
U.S. Cl. 29—157.1 R **6 Claims**

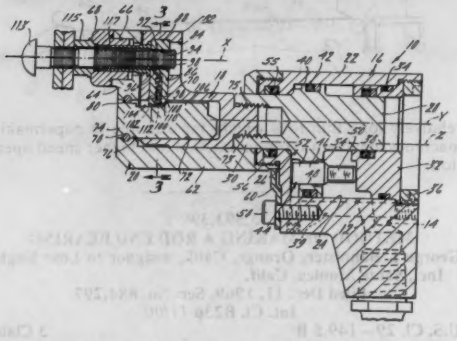


A butterfly valve in which the seat is formed of a stainless steel ring fused to the valve body by casting the body about the prepositioned ring prior to the finished machining thereof.

3,593,401
ECCENTRIC TOOL
Chirco, Peter R., Utica, Mich., assignor to Huck Manufacturing Company, Detroit, Mich.
Filed Feb. 14, 1969, Ser. No. 799,250
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 R **7 Claims**

A tool for setting fasteners of the two-piece type, i.e., such as a lock bolt including a pin and a collar adapted to be swaged thereon, and having an anvil for swagging the collar

onto the pin and including gripping means in line with the anvil for gripping the pin whereby a relative axial force can be applied between the anvil and the gripping means to effec-



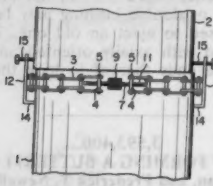
tuate the swagging with the relative axial force being applied on a line eccentric from the axis of the anvil and the gripping means whereby clearance is provided.

3,593,402

APPARATUS FOR ALIGNING THE ENDS OF CYLINDRICAL SECTIONS TO BE JOINED

Masunori Mori, No. 5 Nozaki 21, Wakayama, Japan

Filed Aug. 11, 1969, Ser. No. 849,094
Claims priority, application Japan, Aug. 19, 1968, Sept. 25, 1968, 43/59079;43/69265
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P **6 Claims**



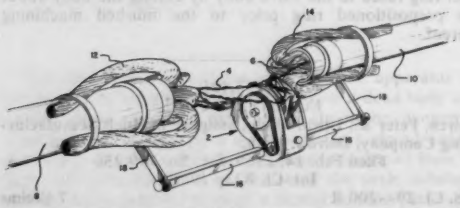
Apparatus for aligning two cylindrical members includes a roller chain wrapped around one of the cylindrical members and a plurality of plates secured to the roller chain. Tightening of the roller chain causes one end of the plates to bear against the second cylindrical member and align it with the first cylindrical member.

3,593,403

APPARATUS FOR SPLICING CABLES CONTAINING PAIRS OF CONDUCTORS

Grey Manning Gurley, Clearwater, Fla., assignor to A.M.P. Incorporated, Harrisburg, Pa.

Filed Mar. 14, 1969, Ser. No. 807,300
Int. Cl. H01r *43/04;* **H05k** *13/00*
U.S. Cl. 29—203 **17 Claims**



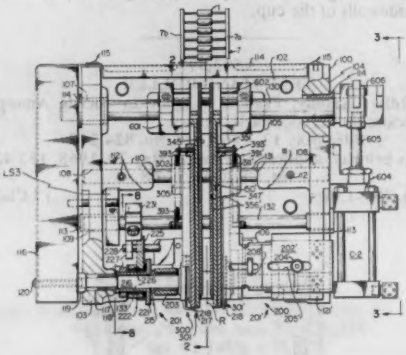
Apparatus for electrically connecting corresponding wires of two pairs of wires to each other comprises an indexible shaft having means at each end for receiving a pair of wires and trimming means intermediate its ends for trimming the wire ends. A dual-connector device is supported in parallel-spaced relationship to the shaft and in a position to receive the trimmed wires. Means are provided on each side of the trimming means for separating the wires of the pairs and subsequently pushing them into the connector device. The connector device comprises two side-by-side separate connectors which are insulated from each other and which are held in a single insulating sheath.

3,593,404

MULTISIZE DUAL CENTER DISTANCE ELECTRONIC COMPONENT INSERTION MACHINE

Phillip A. Ragard, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,726
Int. Cl. H05k *13/04;* **H01r** *43/04;* **B27f** *27/06*
U.S. Cl. 29—203 B **17 Claims**



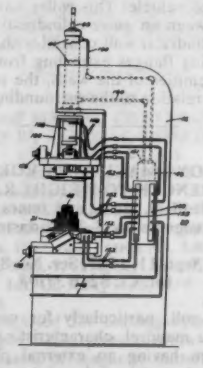
An electronic component insertion apparatus having an insertion head assembly automatically adjustable to accommodate axial lead components having body portions of variable diameter and lengths. The apparatus includes lead end cutters and bending assemblies and spacing means therefor with integrated control means operable to actuate the spacing means to provide two predetermined spacing settings for the varying size components.

3,593,405

APPARATUS FOR FORMING WINDING END TURNS

George G. Hahn, Fort Wayne, Ind., assignor to General Electric Company

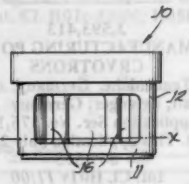
Filed Sept. 5, 1969, Ser. No. 855,720
Int. Cl. H02k *15/06*
U.S. Cl. 29—205 D **14 Claims**



An apparatus for forming magnetic core winding end turn assemblies includes a center-mounting member to receive the

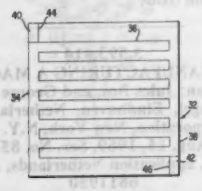
cores thereabout. Arcuate outer jaws are positioned to be outside the end turn assembly and arcuate inner jaws are positioned to be inside the end turn assembly. The jaws are connected to cams outside the end turn assembly, the inner jaws by arms positioned axially beyond the end turn assembly, which are actuated for moving the jaws toward each other to confine the end turn assembly. A forming ring is movable relative to the core between the jaws for applying a compressive force on the end turn assembly to form the assembly into a compact mass. There is a stop, movable relative to the forming ring for regulating the amount of movement of the forming ring. The apparatus has two forming units, each having inner jaws, outer jaws and a forming ring. One forming unit is axially movable relative to the center-mounting member to allow insertion and removal of cores.

3,593,406
METHOD OF RECONSTRUCTION OF DIESEL CYLINDER HEADS
Robert H. Jones, Jr., and Richard B. Jones, both of c/o J & J Casting, Inc., R. R. #1, Box 267, Hibbing, Minn.
Filed Sept. 25, 1969, Ser. No. 861,005
Int. Cl. B23d *19/10*; B23p *7/00*
U.S. Cl. 29—401 **9 Claims**



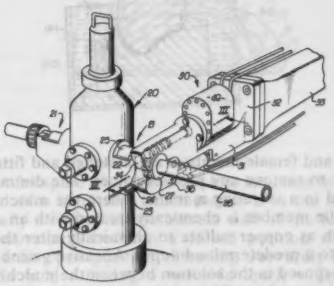
A method of reconstructing worn cylinder heads, where only the inner face of the cylinder head forming a portion of a cylinder for a piston exhibits wear, including the steps of severing the worn portion from the remainder of the cylinder head, providing a new casting to be substituted for the worn portion, preparing the abutting surfaces of the unworn portion of the cylinder head and the new casting, applying a suitable flux to the surfaces, inserting a brazing alloy gasket of a configuration of the cross section of the cylinder head at the line of severance, aligning the parts together, heating the parts and brazing alloy to approximately 1,325° F. for approximately 2 hours, and slowly cooling the bonded parts.

3,593,407
METHOD OF MAKING A PALLET
Dwight C. Brown, 414 N. Granada St., Arlington, Va.
Filed Nov. 7, 1968, Ser. No. 774,020
Int. Cl. B23p *17/00*
U.S. Cl. 29—416 **9 Claims**



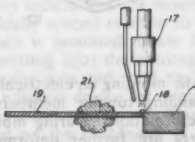
A method for making a pallet and the pallet produced by cutting a piece of solid sheet material and using the cut portion and remaining portion of said solid sheet as two separate pallet decks of substantially the same dimension as the original solid piece.

3,593,408
APPARATUS AND METHOD OF MAKING UNDERWATER PIPE CONNECTIONS
Raymond W. Walker, Huntington Beach, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.
Filed Nov. 26, 1968, Ser. No. 779,004
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—429 **9 Claims**



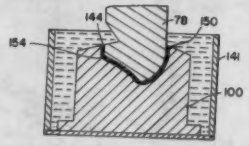
An apparatus and method for making an underwater pipe connection including one or more power wrench means adapted to be universally or multidirectionally positioned for connecting, exemplarily, a pipeline to a wellhead. The apparatus includes a pair of such wrench means for transporting and positioning a spacer pipe between a wellhead and the end of a pipe or fluid flow line spaced therefrom and cooperable with rotatable coupling means carried on opposite ends of such a spacer pipe and cooperable with a fixed connector fitting on such a wellhead and on the end of the pipe flow line; each power wrench means being adapted to rotatably drive a collar carried on a pipe end.

3,593,409
METHOD FOR INHIBITING SPREAD OF HEAT UTILIZING BENTONITE
Joseph J. Silverstein, Woodmere, N.Y., assignor to The Ore-Lube Corporation, College Point, N.Y.
Filed June 11, 1969, Ser. No. 832,071
Int. Cl. B23k *1/20, 31/02*
U.S. Cl. 29—488 **10 Claims**



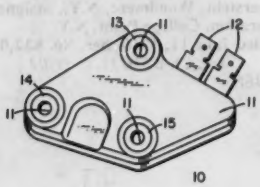
A process for preventing the spread of heat to areas adjacent a portion of a member being subjected to heat, as by gas torch, electric arc or the like. The process includes the application of a paste comprising a water swollen bentonite clay to areas adjacent the zone to be heated, and/or the application of a paste as a temporary protective covering for adjacent objects to be protected from radiation or direct flame contact. The water swollen bentonite acts as a water curtain to absorb the heat. When it is applied adjacent the heated zone of a member, it prevents conduction of heat to other portions of the member which might otherwise be subject to distortion and/or other damage. When applied as a temporary protective covering to adjacent objects, it prevents the covered objects from reaching ignition temperature or otherwise being damaged due to flames or radiation impinging thereagainst.

3,593,410
METHOD FOR CASTING AND FINISHING TOOLS OR DIES
Robert A. Taylor, 6599 Osage St., Allen Park, Mich.
Filed Nov. 21, 1967, Ser. No. 684,763
Int. Cl. B23p 13/04
U.S. Cl. 29—557 7 Claims



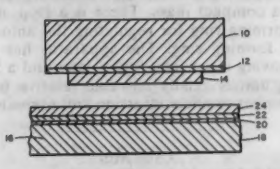
Male and female members are matched and fitted together in order to remove any protuberances. The die members are mounted in a vibrating machine where the matching surface of one die member is chemically treated with an active solution such as copper sulfate to chemically alter the matching surface to a predetermined depth. Abrasive grains or grits are also interposed in the solution between the matching surfaces of the die members. The relative movement between the die members caused by the vibration of the machine results in the abrasive grains scratching the chemically altered surface at the points or areas of contact. Thus by mechanically abrading and chemically altering such areas an extremely high-quality level of tool and die spotting or matching is obtained.

3,593,411
UNITIZED ASSEMBLY PLASTIC ENCAPSULATION PROVIDING OUTWARDLY FACING NONPLASTIC SURFACES
Thomas A. Dunn, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.
Division of Ser. No. 693,611, Dec. 26, 1967. This application Dec. 3, 1968, Ser. No. 780,777
Int. Cl. B01j 17/00; H01l 1/10
U.S. Cl. 29—588 5 Claims



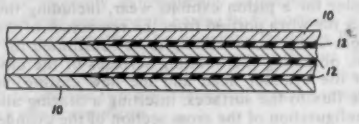
A method for plastic molding an electrical assembly having a plurality of upstanding tubular members with predetermined peripheral deformations. During molding operations the tubular members are further deformed by pressures between two facing die parts such that tolerance of the thickness of the final assembly is less than the sum of the tolerances of the individual parts. The tubular members have radially extending surfaces forming electrical contacts along one surface of the assembly. Another metal plate attached to the tubular members forms substantially the opposite surface for providing a good heat sink connection. The tubular members are spaced peripherally of the metal plate such that mold pressures are evenly applied along the plate for preventing plastic encapsulating material from seeping over the plate. Portions of the plate may extend outwardly from the tubular members with the provision of a rigidizing and apertured deformation in the base plate for preventing flexure of the plate in a mold. The apertures in the rigidizing member permit plastic flow for solidly locking the plastic encapsulating material to the base plate. Plastic encapsulating material is provided inside the tubular members by runners in other parts of the electronic assembly.

3,593,412
BONDING SYSTEM FOR SEMICONDUCTOR DEVICE
Robert S. Foote, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.
Filed July 22, 1969, Ser. No. 843,717
Int. Cl. B01j 17/00; H01l 7/02
U.S. Cl. 29—589 6 Claims



A method of bonding a semiconductor device to a metal substrate involving depositing a gold solder preform onto the device and coating the metal substrate with a first layer of gold, a second layer of silver and a third layer of gold. The device is bonded to the metal substrate by heating the substrate to an elevated temperature and placing the gold preform on top of the third gold layer of the substrate.

3,593,413
METHOD OF MANUFACTURING POWER-CURRENT CRYOTRONS
Wilhelm Kafka, Tennenlohe, Germany, assignor to Siemens Aktiengesellschaft, Erlanger, Germany
Continuation of application Ser. No. 575,117, Aug. 25, 1966, now abandoned. This application July 22, 1969, Ser. No. 849,555
Int. Cl. H01v 11/00
U.S. Cl. 29—599 9 Claims

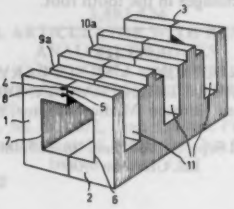


Described is a method of manufacturing a power-current cryotron having a layered gate-conductor structure which in the normal conducting state at the cryotron operating temperature has a free electron path length smaller than in the superconductor material of the cryotron. The method comprises steps of situating a pulverulent insulating material between a plurality of layers of superconductor material, and then compressing the layers together with the pulverulent insulating material therebetween to reduce the cross-sectional area of the cryotron. The superconductor material is selected from the group consisting of lead and niobium and the pulverulent insulating material is selected from magnesium oxide and aluminum oxide.

3,593,414
METHOD OF MANUFACTURING A MAGNETIC HEAD
Jacobus Pieter Beun; Jules Bos, and George Ludwig Walther, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 15, 1969, Ser. No. 850,546
Claims priority, application Netherlands, Aug. 22, 1968, 6811950
Int. Cl. H01f 7/06
U.S. Cl. 29—603 4 Claims

A very precise method of manufacturing multiple magnetic heads which are to write, read and/or erase extremely narrow (<0.2 mm.) tracks situated beside each other, for example, video heads or "tunnel-erase" heads. For that purpose very shallow (200—300 μ) parallel pairs of channels are sawn in a "sandwich" consisting of two plates of ferrite combined by

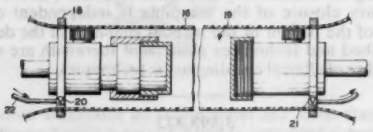
means of glass which channels are afterwards filled with glass. Deeper (1 mm.) sawcuts are then provided in the conventional manner between the pairs of channels mutually and filled with nonmagnetizable intermediate members.



3,593,415
METHODS OF UNDERWATER MECHANICAL ASSEMBLY OF ELECTRICAL CONNECTORS, AND THE LIKE

Delbert R. Wofford, Owensboro, Ky., assignor to Texas Gas Transmission Corporation, Owensboro, Ky.

Filed Aug. 28, 1969, Ser. No. 853,807
Int. Cl. H01r *43/00*; H05k
U.S. Cl. 29—628 **5 Claims**

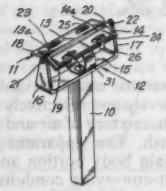


A method of assembling electrical cables underwater without subjecting the electrical circuits to salt water is disclosed. A flexible membrane isolates a work area and the mechanical assembly and disassembly of parts takes place therein by grasping the membrane from the water side. The membrane may be a hollow toroid and the inner surface extending about the work area can be ruptured to produce more working area and less area that is purged of water before rupture. The outer membrane can be ruptured after the operation is terminated by mating the connectors in a waterproof seal.

3,593,416
SAFETY RAZOR

Roger C. Edson, Old Saybrook, Conn.

Filed Oct. 10, 1968, Ser. No. 766,394
Int. Cl. B26b *21/00*
U.S. Cl. 30—50 **13 Claims**

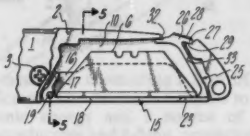


Disclosure relates to a razor having a bifurcated yoke at one end of a handle and on which a blade carrier is pivotally mounted to rock. The blade carrier has surfaces for replaceably mounting a pair of blades in an opposed inclined relationship with a space between adjacent cutting edges. Each of the blades then acts as a guide for the opposite blade as they are moved in opposite directions and the carrier pivots to follow the contour of the surface being shaved.

3,593,417
HAND TOOL HAVING A HOLDER FOR SPARE BLADES AND THE LIKE

Robert F West, West Simsbury, and Robert S. Hyde, East Hartford, both of, Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Aug. 13, 1969, Ser. No. 849,663
Int. Cl. B26b *1/11*
U.S. Cl. 30—125 **10 Claims**

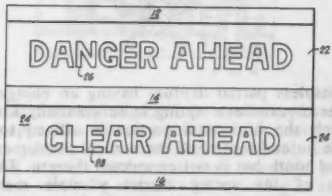


A holder for spare blades and the like mounted in the handle portion of a hand tool which holder is in the form of a tray pivotally mounted in the bottom wall of the handle for swinging movement between a closed position within the handle and an open position extending outwardly from the handle, the holder having a movable catch which in the closed position of the tray extends through an opening in a wall of the handle opposite said bottom wall for engagement with a keeper and being exposed at said opening for manual actuation to disengage the catch from the keeper.

3,593,418
SAFETY WARNING DEVICE

James P. Evans, 3233 S.W. 23rd St., Oklahoma City, Okla.

Filed June 10, 1969, Ser. No. 831,857
Int. Cl. G09f *13/00*
U.S. Cl. 40—130 **1 Claim**



A safety warning device constituting a sign attachable to the bumper of a vehicle, or mountable at the rear window of a vehicle, and including a pair of translucent or transparent panels which carry indicia and are mounted in a supporting structure in vertically spaced relation to each other. Behind each of the panels is mounted means for illuminating the panel, and transmitting light therethrough. The illuminating means is electrically actuated, and the electrical circuitry utilized includes a flasher device for intermittently energizing and deenergizing the source of illumination, ON-OFF switches mounted on the dashboard of the automobile for directing electrical energy to the source of illumination behind a selected one of the two panels, and a source of electrical energy such as a battery or the like.

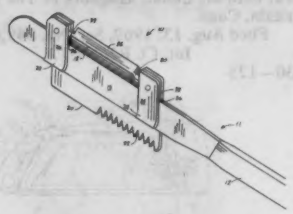
3,593,419
CLIP-ON SEVERING DEVICE

Frank M. Hula, 5201 Hamm Ave., Cleveland, Ohio

Filed Sept. 2, 1969, Ser. No. 854,436
Int. Cl. B26b *11/00*
U.S. Cl. 30—142 **10 Claims**

A device for severing which is adapted to be clipped on the blade of a knife. The device comprises a thin strip of metal having two parallel faces bounded by a periphery, and includes a base portion and an offset portion. The base portion has two separate cutting edges, a serrated scraping edge and a sharp slicing edge, both being formed on its periphery. The offset portion includes a sharp cutting edge for peeling of vegetables or fruits. Spring clips, fixed adjacent one face of

the thin metal strip, are adapted to clamp the strip against the knife blade. A bar which is sandwiched between the clips and the face of the metal strip extends the length of the offset



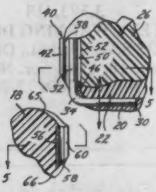
peeling edge and is spaced peripherally thereof to provide a landing for exerting finger pressure on the device when it is in operative position.

3,593,420

CLASPLESS PARTIAL DENTURE AXIAL RETAINER CONSTRUCTION

Arthur Ritter, 1902 Chestnut St., Philadelphia, Pa.

Filed Dec. 15, 1969, Ser. No. 885,217
Int. Cl. A61c *13/22*
U.S. Cl. 32—5 **13 Claims**



A claspless partial denture having an elongated resilient member or cantilever spring in substantially L-shaped form in which the horizontal portion is affixed to the saddle beneath an end tooth and the vertical portion extends along said end tooth but is not connected thereto. The horizontal portion of the spring carries a male member which telescopingly interlocks in a female slot or channel member in the crown abutment which opens through the occlusal and gingival surfaces thereof and has a reduced throat which opens through one vertical face thereof, either the distal or mesial face, depending on the position of attachment of the partial denture. A bracing arm is carried by a strut of the saddle to one side of but unconnected to the vertical portion of the cantilever spring, the bracing arm being adapted to engage the crown abutment. The denture is adjustable, self-cleaning and absorbs displacement stresses.

3,593,421

MULTIHELICAL OMNIARCH

Allen C. Brader, 1305 Hamilton St., Allentown, Pa.

Filed Nov. 15, 1967, Ser. No. 683,405
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **10 Claims**

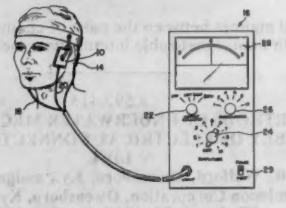
A resilient arch form structure characterized by helices formed integrally therewith. The helices are pitched and may be interspersed integrally within the arch form structure or may be continuous within the arch form structure such as a continuous wire, plastic form or the like. The arch form is operatively connected with a tooth for delivering a force simultaneously in at least three planes of space and also enabling force application in the form of torsion or torque to achieve position changes in the tooth root.

3,593,422

METHOD OF PRODUCING A MUSCULARY BALANCED CLOSURE OF THE HUMAN MANDIBLE

Bernard Jankelson, Stimson Medical Center, Seattle, Wash. 98101

Filed Sept. 5, 1969, Ser. No. 855,480
Int. Cl. A61c *9/00*
U.S. Cl. 32—21 **17 Claims**



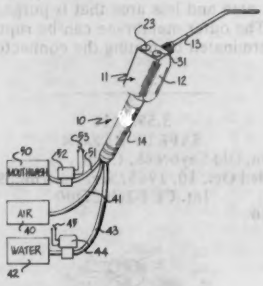
Mandibular closure is produced by simultaneous and even electrical programmed stimulation of the motor nerves controlling the masticatory and facial muscles. The resultant involuntary closure of the mandible is independent of the volition of the patient or the manual guidance of the dentist. The method and techniques associated therewith are useful in a number of clinical and diagnostic techniques.

3,593,423

MULTIPURPOSE DENTAL SYRINGE APPARATUS

Arthur L. Jones, and George V. McGaha, both of Charlotte, N.C., assignors to The Pelton & Crane Company, Charlotte, N.C.

Filed Apr. 18, 1969, Ser. No. 817,378
Int. Cl. A61c *19/02*
U.S. Cl. 32—22 **12 Claims**



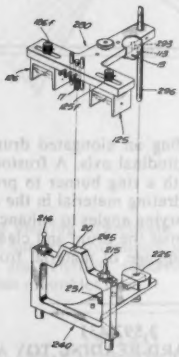
Dental syringe apparatus characterized by being so constructed as to alternatively and selectively dispense a spray of air, water, mouthwash, mixture of air and water, and mixture of air and mouthwash. The apparatus comprises syringe means including a main body portion and a nozzle portion having liquid- and air-conveying conduits therethrough and selectively operable valve means therein for alternatively and selectively dispensing a spray of air, liquid and a mixture of air and liquid from the nozzle portion, means for supplying air, water and mouthwash under pressure to the syringe means including separate supply means and separate conduit means, valve means operatively connected with the water and mouthwash conduit means for selectively and alternatively allowing and preventing the conveying of water and mouthwash therethrough to the syringe liquid conduit means, and means operatively connected with the mouthwash, water and syringe liquid conduit means for merging the mouthwash

and water conduit means into the syringe liquid conduit means.

3,593,424
DENTAL ARTICULATOR WITH REMOVABLE ANALOGUE BLOCKS

Robert L. Lee, Colton, Calif., assignor to Gene W. Arant; Robert L. Lee and Arlene M. Lee, Los Angeles, Calif., part interest to each

Division of Ser. No. 569,472, Aug. 1, 1966, Pat. No. 3,452,439. application June 25, 1969, Ser. No. 836,293
Int. Cl. A61c *11/00*
U.S. Cl. 32—32 **19 Claims**



A dental articulator including upper and lower frames, the lower frame having a pair of laterally separated spherical styluses representing simulated condyles which extend upwardly therefrom. The upper frame has a pair of lateral arms and a forward arm, and the forward arm has means for indicating the orbital axis reference point. The lateral arms of the upper frame are adapted to receive a pair of simulated upper joint members, or analogue blocks, which are removably fastened thereto.

Each simulated upper joint member has a roughly cubical configuration except for one longitudinal edge being cut off and curved in approximately a 90° arc so that the configuration of the member also corresponds approximately to one-quarter of a cylinder. A generally flat side opposite the curved surface is adapted to be attached to the underside of the articulator upper frame. Each simulated upper joint member has an irregularly shaped opening formed in its curved surface, one part of that opening representing the centric relation position.

Each simulated upper joint member (analogue block) also has a dimple formed in its outward lateral side. When the spherical styluses of the lower frame are received in the centric parts of the openings of the simulated upper joint members, the common axis of the two dimples also passes through the radius centers of the spherical styluses.

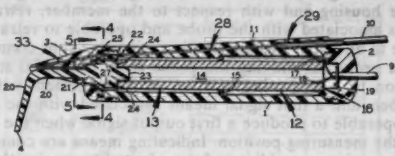
The articulator also includes a centric reference means for indicating the lateral alignment of the upper frame relative to the lower frame. The centric reference means has upper and lower parts extending from the respective frames, the two parts being adapted to interengage at a point precisely located on the common axis that passes through the radius centers of the two spherical styluses.

3,593,425
ELECTRIC ULTRASONIC TOOTH-CLEANING APPARATUS

Seymout Robinson, Miama, Fla., assignor to Hydrosonic Corporation, Miami, Fla.

Filed Sept. 10, 1969, Ser. No. 856,689
Int. Cl. A61c *3/01*
U.S. Cl. 32—58 **5 Claims**

An apparatus for rapidly cleaning and removing plaque and calculus from the teeth without damage to the enamel and injury to the gums, consisting of a device for hand manipulation containing an electronic ultrasonic transducer coupled to a quick-replaceable cleaning applicator formed from wear-resistant plastic material. The handle of the device

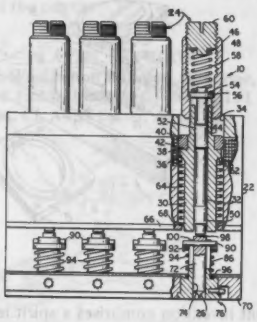


includes channel means for conducting a flow of pressurized water to the applicator. The device is coupled to a source of electronic ultrasonic energy and a source of pressurized water by flexible conductors and tubing, respectively.

3,593,426
CUTTER HEAD ASSEMBLY

Gerald S. Domagalski, San Jose, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Aug. 11, 1969, Ser. No. 848,801
Int. Cl. B43l *13/00*
U.S. Cl. 33—18 **5 Claims**

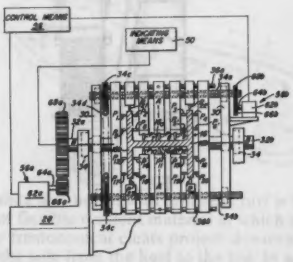


A cutter head assembly adaptable for use on a plotter-type mask making apparatus utilizes a plurality of actuators within a block each operable by a controllable solenoid. Each actuator includes a guide and a relatively movable plunger thereon which is vertically aligned with a cutting or scribing instrument which is retained by an insert guide member fixed within a plate below the actuator. Both the stroke of the cutting instrument and its pressure on material being cut are controllable by adjustments on the actuator.

3,593,427
APPARATUS FOR DETERMINING A DIMENSION OF A MEMBER

Eugene V. Abarotin, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation

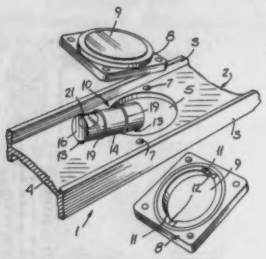
Filed Feb. 26, 1969, Ser. No. 802,553
Int. Cl. G01b *7/28*
U.S. Cl. 33—174 PA **10 Claims**



An apparatus for determining a dimension of a member and having a frame, a sensing means on the frame adjacent

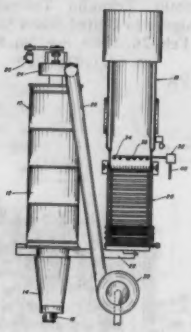
the member and the sensing means having opposed sensing assemblies aligned adjacent the dimension is disclosed. Each of the sensing assemblies has a housing, a probe reciprocable in the housing and with respect to the member, retraction means associated with the probe and operable to retract the probe to an initial starting position, biasing means connected to the probe for moving the probe from the initial starting position to a measuring position into engagement with the member, and a first signal means associated with the probe and operable to produce a first output signal when the probe is in the measuring position. Indicating means are connected to the sensing assemblies and are adapted to receive the first output signals from the sensing assemblies and to indicate the dimension.

3,593,428
SPIRIT LEVEL
Sydney Jacoff, Mineola, N.Y., assignor to Great Neck Saw Manufacturers, Inc., Mineola, N.Y.
Filed Sept. 26, 1968, Ser. No. 762,884
Int. Cl. G01c *9/24*
U.S. Cl. 33—211 **9 Claims**



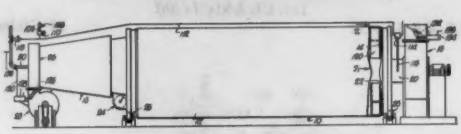
The present invention comprises a spirit level in which the vial thereof has a cylindrical outer surface and a curved inner surface. The curved inner surface is formed during the molding of the vial by taking advantage of the memory and natural resiliency of the plastic used.

3,593,429
METHOD OF DEHYDRATING A CROP
Stanley P. Thompson, Box 7, St. Marys, Kans.
Filed Aug. 4, 1969, Ser. No. 847,270
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **8 Claims**



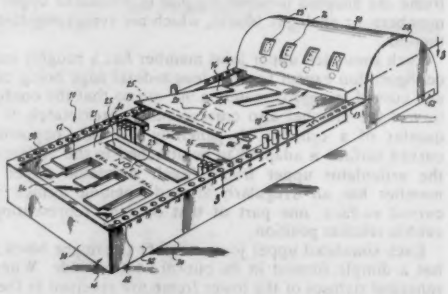
This method of dehydrating a crop such as alfalfa or the like includes the step of spraying a coating of water on the crop just prior to advancement of the crop into the heated dehydrator drum.

3,593,430
CROP DEHYDRATOR
Stanley P. Thompson, Box 7, St. Marys, Kans.
Filed Nov. 4, 1968, Ser. No. 773,188
Int. Cl. F26b *11/02*
U.S. Cl. 34—108 **8 Claims**



A dehydrator including an elongated drum mounted for rotation about its longitudinal axis. A frustoconical furnace sidewall cooperates with a ring burner to provide hot combustion gases for dehydrating material in the drum. Vanes in the drum are bent at varying angles to enhance even distribution of the material across the drum and cleats are also provided to reduce the slippage of material from some of the vanes.

3,593,431
EDUCATIONAL CARD-READING TOY APPARATUS
Pasquale A. Candido, 13 Prospect Ave., Brentwood, N.Y., and Elliott Manketo, Farm Road Head of the Harbor, St. James, N.Y.
Filed Apr. 14, 1969, Ser. No. 815,644
Int. Cl. G09b *1/04*
U.S. Cl. 35—8 R **7 Claims**



This toy has a plurality of cards inscribed with pictures of figures such as animals. Each card has a plurality of projections of different lengths. A card-reading device has rotatable discs with letters at their edges exposable at windows in the device. When a card is inserted in the device, the discs rotate and the name of the figure on the card appears at the windows. The device has lamps arranged to illuminate the letters appearing at the windows.

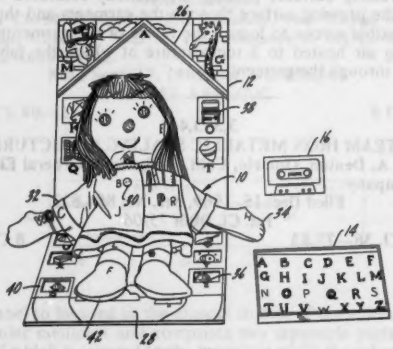
3,593,432
TEACHING AID FOR COACHING SPORTS AND MANUAL SKILLS
Michael L. Reynolds, 8304 E. 110th Terrace, Kansas City, Mo.
Filed Nov. 7, 1969, Ser. No. 874,871
Int. Cl. G03b *25/00*
U.S. Cl. 35—29 R **5 Claims**

A teaching aid comprising transparencies is disclosed for coaching sport and other manual skills requiring coordina-

tion, in time, of various parts of the body. Transparencies showing various incremental movements of a complicated action in a play or the like are arranged to be flipped for

sequential rapid viewing to indicate movements of a right-handed or a left-handed professional player as a teaching aid. Transparencies are generally secured at one edge as by a gripper to provide a booklet form.

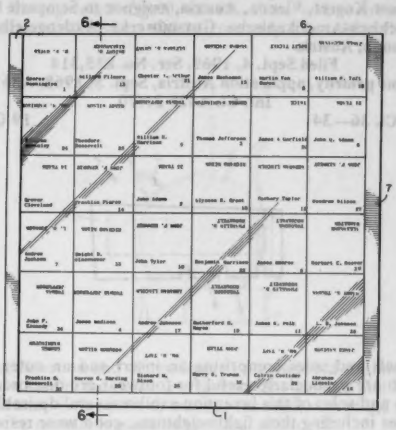
3,593,433
METHOD AND APPARATUS FOR TEACHING READING
Leo L. Dillon, and Helen S. Dillon, both of 10420 S. Lavergne, Oak Lawn, Ill.
Filed Jan. 26, 1970, Ser. No. 5,513
Int. Cl. G09b *17/00*
U.S. Cl. 35—35 R **6 Claims**



This invention presents an educational kit and associated method of teaching. Particularly well suited for use by young children, this invention utilizes environmental objects familiar to them to captivate their attention while they are schooled in the fundamentals of reading.

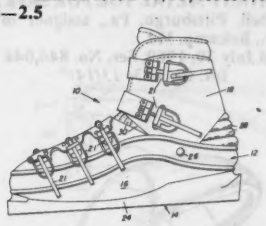
3,593,434
EDUCATIONAL VISUAL AID
James McGarry, 118-60 Metropolita Ave. Apt. 3L, Kew Gardens, Queens, N.Y.
Filed Oct. 14, 1969, Ser. No. 866,239
Int. Cl. A63f *9/10*
U.S. Cl. 35—73 **4 Claims**

A double solution puzzle having pieces that afford on one face the flexibility of inversion with double factual question-



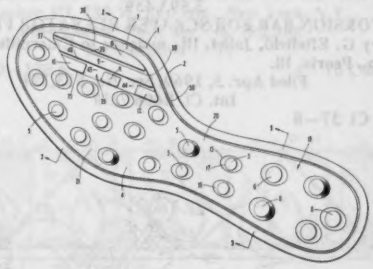
and-answer opportunity for solution that also serves at least one other face of the puzzle.

3,593,435
PLASTIC SKI BOOT
Robert B. Lange, Washington Building, Dubuque, Iowa
Filed Jan. 6, 1969, Ser. No. 789,151
Int. Cl. A43b *00/00*; A61f *5/00*
U.S. Cl. 36—2.5 **2 Claims**



A boot of heavy gauge plastic having a molded plastic foot portion having sole with parallel sides, a gaiter of heavy gauge plastic pivoted to the foot portion, and an inner sock and tongue member for receiving a formable, stable dialatent material such as polybutadiene.

3,593,436
ATHLETIC SHOE SOLE
Frank Vietas, Bedford, Mass., assignor to Hyde Athletic Industries, Inc., Cambridge, Md.
Filed May 29, 1969, Ser. No. 828,823
Int. Cl. A43b *13/06*
U.S. Cl. 36—32 **7 Claims**



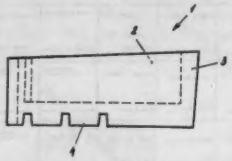
An athletic shoe sole useful with synthetic turf is formed of a single piece of flexible resilient material in which a plurality of substantially frustoconical cleats project downwardly from the bottom of the sole from the heel to the toe. In addition, a set of elongated cleats are positioned on the ball part of the sole adjacent to the instep. These elongated cleats are angled inwardly to provide lateral traction.

3,593,437

HEEL FOR FOOTWEAR

Herbert Kogert, Vienna, Austria, assignor to Semperit Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft, Vienna, Austria

Filed Sept. 4, 1969, Ser. No. 855,314
Claims priority, application Austria, Sept. 5, 1968, A8611/68
Int. Cl. A43b 21/20
U.S. Cl. 36—34 19 Claims



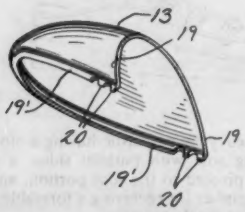
Heels and soles comprising an insert and an outer layer, which are particularly useful for footwear are disclosed. The heels and soles of this invention exhibit several desirable properties including their lightweightness, good wear resistance, as well as being readily adhered to the shoe material. The insert is preferably made from a rigid polyurethane foam although a rigid polyether or polyester foam may also be employed. The outer layer preferably consists of a semirigid, closed-cell foamed polyurethane.

3,593,438

SPREAD-RESISTANT METAL TOE FOR SAFETY SHOES

Martin J. Mitchell, Pittsburgh, Pa., assignor to Bata Shoe Company, Inc., Belcamp, Md.

Filed July 30, 1969, Ser. No. 846,044
Int. Cl. A43c 13/14
U.S. Cl. 36—77 1 Claim



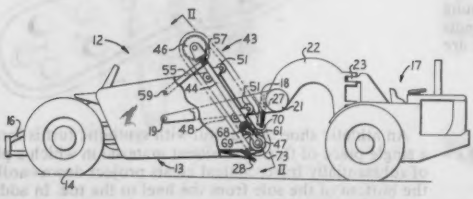
The lower edge at each side of the rear of the metal toe piece of a safety shoe is formed with several sawteeth which are positioned to bite into the welt of the shoe in response to a blow on the toe piece of a type which might otherwise result in lateral spreading of the sides of the toe piece.

3,593,439

TORSION BAR FOR SCRAPER ELEVATOR FRAME

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 3, 1969, Ser. No. 813,191
Int. Cl. B60p 1/38
U.S. Cl. 37—8 7 Claims



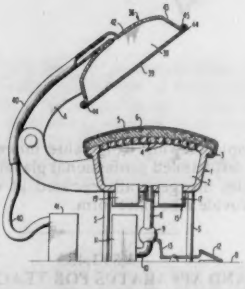
In a self-loading scraper having an elevator frame, a torsion shaft interconnecting the lower elevator frame support link members so as to provide a stable suspension means for the elevator frame. The torsion shaft is fixed relative to the support links and mounted for movement relative to the elevator frame.

3,593,440

GARMENT TREATMENT METHOD AND APPARATUS

George Schlemon, 3060 Pharr St., N.W., Atlanta, Ga.

Division of Ser. No. 736,176, June 11, 1968, Pat. No. 3,501,857.
Continuation-in-part of application Ser. No. 676,098, Oct. 18, 1967, now Patent No. 3,486,255, which is a continuation-in-part of application Ser. No. 543,996, Apr. 20, 1966, now abandoned. This application Sept. 15, 1969, Ser. No. 871,006
Int. Cl. D06f 71/34, 71/36
U.S. Cl. 38—16 9 Claims



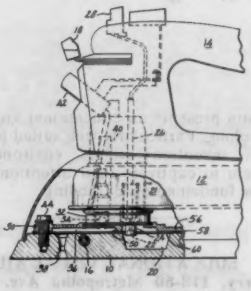
A method and apparatus for imparting a permanent press to garments comprising arranging the garments in their respective proper pressing position on a pressing surface, applying light pressure to the garments with a flexible screen which substantially conforms to the shape of the garments on the pressing surface, passing substantially saturated steam from the pressing surface through the garments and through the flexible screen to loosen the fabric of the garments, and passing air heated to a temperature at which the fabric is cured through the garment.

3,593,441

STEAM IRON METALLIC SEALING STRUCTURE

Bryce A. Denton, Ontario, Calif., assignor to General Electric Company

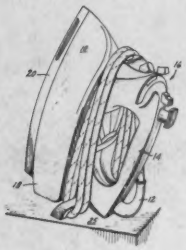
Filed Dec. 15, 1969, Ser. No. 884,823
Int. Cl. D06f 75/06
U.S. Cl. 38—77.83 8 Claims



The invention discloses a metallic sealing structure for steam and steam-powered spray irons which use a thin ridged

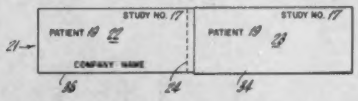
aluminum gasket disposed between a coverplate and the soleplate for sealing a steam generating and steam distributing cavity to confine steam flow in desired channels.

3,593,442
IRON STABILIZER AND CORD SUPPORT
William E. Davidson, Ontario; Harold S. Foster, Ontario, and Llewellyn Delano Busby, Upland, all of, Calif., assignors to General Electric Company
Filed Nov. 6, 1969, Ser. No. 874,582
Int. Cl. D06f *75/40*
U.S. Cl. 38—79 **8 Claims**



The invention discloses a stabilizing and cord support means in a single structure wherein outrigger-type arm means is attached to the iron to extend sideways from the iron. The outrigger is equipped with rearward extending ears at the ends of the arm whereby the ears are additional supports for the iron in the heel rest position. The dimension of the ears is such that a cord may be wrapped around the arm while it acts as a stabilizing means with no interference by the cord when the iron is in rest position.

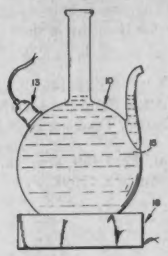
3,593,443
LABEL FOR USE IN BLIND CLINICAL STUDIES OF A MEDICAMENT
Julius Christ Demetrius, Jr., Lansdale, and Wayne Martin Grim, Chalfont, both of, Pa., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Sept. 17, 1969, Ser. No. 858,669
Int. Cl. A44c *3/00*
U.S. Cl. 40—2 **6 Claims**



A label to be used in the clinical studies of the effects of a particular medicant and comprises two separable parts, one part of which is secured to the container while the other goes into a file and with both sections having visible thereon the necessary patient and study numbers but not the nature of the medicant nor the dosage. This information is on the file section of the label but is normally hidden by a removable cover.

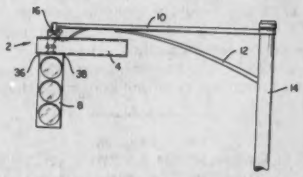
3,593,444
VISUAL DISPLAYS
Harold S. Akrongold, and Rochelle Akrongold, both of 39 Cathay Road, East Rockaway, N.Y.
Filed Nov. 25, 1968, Ser. No. 778,502
Int. Cl. G09f *13/24*
U.S. Cl. 40—106.21 **11 Claims**

A liquid in a transparent container has a relatively small quantity of pearl essence crystalline powder pigment mixed therewith. When quiescent, the mixture appears substantially opaque and lacking a mist pattern. When agitated, as by stirring by a motor-driven bar or propeller or the like, the mixture while remaining substantially opaque takes on a constantly changing mist pattern containing, for example, randomly moving veins of gold, streaks, lines, and/or areas, all more or less darkened, which constantly alter their shape,



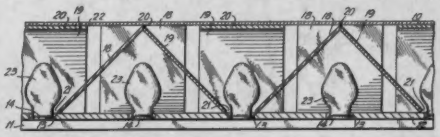
texture, direction and dimensions. It may be said to simulate marble wherein the veins are in constant change and flux. When a lamp is lit within or without the enclosure of the container, the mixture is made to appear translucent.

3,593,445
STREET SIGN ARRANGEMENT
Lyle E. Gant, Indianapolis, Ind., assignor to John W. Guterman, Indianapolis, Ind., a part interest
Filed May 29, 1969, Ser. No. 829,025
Int. Cl. G09f *7/22*
U.S. Cl. 40—128 **3 Claims**



A street sign arrangement for mounting on a traffic signal having a base section and a street name plaque section. The base section is proportioned for mating engagement with the top portion of a traffic signal. A slot is provided in said base section and is proportioned to receive a cylindrical threaded portion of the supporting structure of the traffic signal. A nut forming a part of the supporting structure and received on said threaded portion is used to fix the street sign arrangement to said traffic signal.

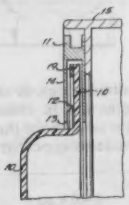
3,593,446
ILLUMINATED MULTICOLOR DISPLAY DEVICE
Herbert Gesner, III, 789 W. End Ave., New York, N.Y.
Filed Dec. 9, 1968, Ser. No. 782,308
Int. Cl. G09f *13/12*
U.S. Cl. 40—130 B **10 Claims**



An illuminated display device includes a plurality of side-by-side longitudinal sets of alternately oppositely inclined reflector panels converging to apices, the apices of each set being laterally aligned with the troughs of adjacent sets, a plurality of side-by-side transverse sets of alternately op-

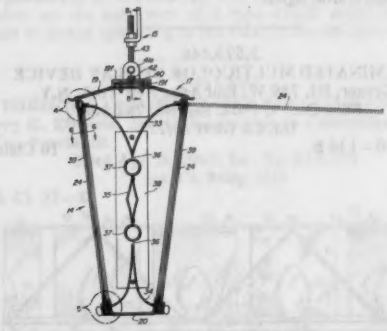
positely inclined reflector panels interweaving the first sets, and a translucent screen extending along parallel to the plane of the apices, and being illuminated by substantially reflected light. Periodically energized and deenergized electric bulbs of different colors are positioned in the dihedrals defined by the reflector rear faces and project light onto the screen by way of the front faces of corresponding registering reflectors. One or more of the reflector front faces may carry indicia.

3,593,447
FACE RETAINER FOR ILLUMINATED SIGNS
Alvin Winegarten, Dallas, Tex., assignor to Texlite Industries, Inc., Dallas, Tex.
Filed Sept. 22, 1969, Ser. No. 859,697
Int. Cl. G09f *13/00*
U.S. Cl. 40—130 R **4 Claims**



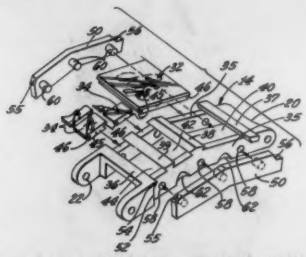
A retainer device for translucent plastic panels or faces for illuminated signs whereby to secure the panels against displacement from the sign housings or frames by wind pressures thereon. The plastic panels, being flexible and subject to lateral expansion and contraction under varying temperature conditions, are customarily installed in their frames with liberal marginal tolerances thus, when flexed by wind pressures at relatively low temperatures, the face panels can escape their mountings resulting in damage thereto.

3,593,448
INTERNALLY LIGHTED, OVERHEAD, TRAFFIC SIGN FOR STREETS AND HIGHWAYS
Herbert R. Schoepf, Salt Lake City, and John L. Babcock, Sandy, both of, Utah, assignors to Nu-Art Lighting and Manufacturing Company, Salt Lake City, Utah
Filed July 22, 1969, Ser. No. 843,368
Int. Cl. G09f *13/00*
U.S. Cl. 40—132 **12 Claims**



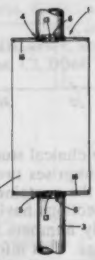
An internally lighted, overhead sign for streets and highways that is so constructed as to be quickly legible to passing traffic and easily maintained. A housing framework made up of extruded aluminum components receives and hinges sign panels that can be swung open and closed for quick and easy maintenance. The framework includes extruded clamping strips for normally holding the sign panels tightly closed, sealing strips, and drip guards overhanging the sign panels for protection from precipitation. Reflectors for directing light to opposite panel sides converge along the vertical axis of the sign in alignment with longitudinal axes of lighting elements. Hangers provide for controlled swinging movement of the sign to accommodate wind currents.

3,593,449
WRIST BAND ATTACHMENT
Lonnie R. Nielson, Las Vegas, Nev., assignor to Carlon Engineering Company, Incorporated, Las Vegas, Nev.
Filed June 5, 1969, Ser. No. 830,663
Int. Cl. G09f *7/02*
U.S. Cl. 40—140 **20 Claims**



A frame for incorporation into a wrist band adjacent a wrist band watch has at least one window opening to receive a corresponding ornamental panel or insert which is secured by releasable keeper means. The frame provides a guide channel for movement of the insert into assembled position and the removable keeper means blocks the channel against withdrawal of the insert.

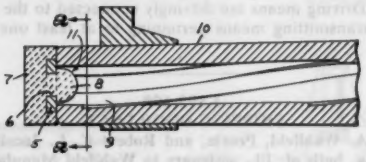
3,593,450
POLE BANNER SIGN CONSTRUCTION
Samuel J. Mollet, III, Canton, and Thomas Friedrichsen, Massillon, both of, Ohio, assignors to The Massillon-Cleveland-Akron Sign Company, Massillon, Ohio
Filed Nov. 26, 1969, Ser. No. 880,117
Int. Cl. G09f *7/18*
U.S. Cl. 40—145 R **7 Claims**



The pole banner sign construction has permanent hardware for supporting a flexible banner on a pole. All of the hardware is permanently mounted on the pole, eliminating the need for removing hardware components for storage when not used for supporting a banner. The hardware can be positioned easily on the pole to be inconspicuous and out of the way when not used to support a banner component. A simple flexible banner that may be changed from time to time is mounted on the hardware and is adapted to be folded into a small package for shipment in an envelope. A pair of banner members may be similarly mounted on either side of the pole. The banner may be changed from time to time without the use of any tools by merely unhooking several

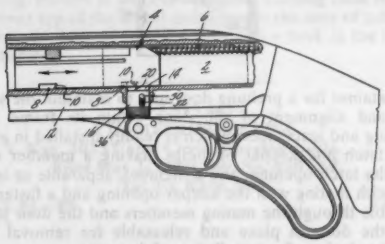
hooks from banner engagement and then hooking the replacement banner in place.

3,593,451
PROTECTORS FOR FIREARM MUZZLES
John J. McDonnell, 1245 Broadway, Rensselaer, N.Y.
Filed Nov. 27, 1968, Ser. No. 779,520
Int. Cl. F41c *21/14*
U.S. Cl. 42—1 N 1 Claim



Protectors for the muzzles of firearms are disclosed, each protector being shaped and dimensioned to close the muzzle end of a firearm barrel and including a magnetic member dimensioned to extend across the bore and a centering projection dimensioned to fit freely therein to center the member for engagement with the muzzle.

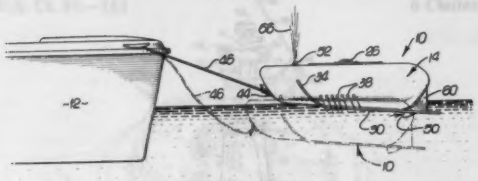
3,593,452
BOLT STOP FOR FIREARMS
Roger M. Pekarek, West Simsbury, Conn., assignor to Colt's Inc., Hartford, Conn.
Filed Aug. 18, 1969, Ser. No. 850,932
Int. Cl. F41c *11/06, 11/00*
U.S. Cl. 42—16 F 3 Claims



A spring biased bolt stop is slidably retained in a passage disposed in a trigger housing. A slidable bolt, which includes a periphera' notch, is mounted in a receiver section adjacent the trigger housing. A projection on the upper surface of the bolt stop is adapted to be received in the notch to prevent axial movement of the bolt. A surface of the projection forms an acute angle with the upper surface of the bolt stop and is adapted to contact a parallel surface of the notch so as to check the spring urged movement of the bolt stop away from the notch. A serrated contour on the lower exterior portion of the bolt stop generally conforms to the adjacent exterior surface of the trigger housing when the bolt stop is spring urged to its lower limit of axial travel away from the notch. The bolt stop is manually pressed into the notch for retention of the bolt and released from the notch by displacing the bolt.

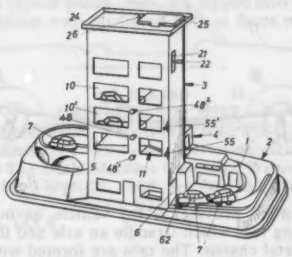
3,593,453
HIGH-SPEED BAIT SLED
Gary R. Bishop, 950 Ashbridge, Harbor City, Calif., and Kenneth H. Bishop, 4591 Don Felipe Drive, Los Angeles, Calif.
Filed May 16, 1969, Ser. No. 825,315
Int. Cl. A01k *97/04*
U.S. Cl. 43—55 5 Claims

A water-borne device, such as a high-speed bait sled to be towed behind a motor-powered boat, having a chamber with a forwardly facing inlet below the waterline and an exposed outlet above the waterline arranged in a manner such that ram pressure at the inlet occasioned by motion of the device



through the water induces waterflow into the chamber. The water emerges from the chamber through the exposed outlet to indicate water circulation through the chamber.

3,593,454
TOY PARKING GARAGE
Alfred Einfalt, Nurnberg, Germany, assignor to Gebruder Einfalt Blechspielwarenfabrik, Nurnberg, Germany
Filed Oct. 29, 1968, Ser. No. 771,446
Claims priority, application Germany, Feb. 9, 1968, P 16 78 331.6
Int. Cl. A63h *18/06*
U.S. Cl. 46—12 23 Claims



A toy representing a multistory car park and having a descending track along which toy vehicles, such as toy motor cars may roll, and a lift or elevator in a shaft for raising the vehicles from the lower level end to the upper level end of the track between an entrance into the lift shaft at one end of the track and an exit from the shaft at the other end of the track, a catch combined with an advance action catch being provided for intercepting a vehicle outside the entrance, characterized in that the toy vehicles are raisable by the lift above the level of the exit and possibly also lowerable to below the level of the entrance for selectably transferring the vehicles into and collecting them from parking bays at levels above the exit or below the entrance.

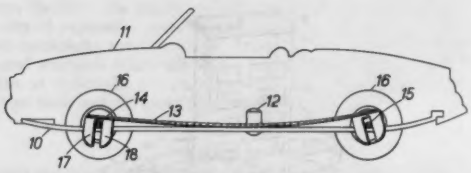
3,593,455
FIGURINE DOLL
Billie Joe Farris, 6227 Shady Brook Lane, Apt. 167, Dallas, Tex.
Filed Apr. 29, 1969, Ser. No. 828,068
Int. Cl. A63g *3/10*
U.S. Cl. 46—151 6 Claims

Using horseshoe nails, a figurine, for example simulating an animal such as a human being, is constructed by bending the shanks of the nails to form a pair of legs with feet; securing the feet to a baseplate, as by solder or welding; securing the heads of the leg nails together with the lower end of the shank of a trunk nail between them; bending another pair of nails to simulate arms; and securing the heads of these nails as shoulders on opposite sides of the shank of the trunk nail

immediately below the head thereof. A miniature implement, such as a golf club, is optionally formed of wire with a lump

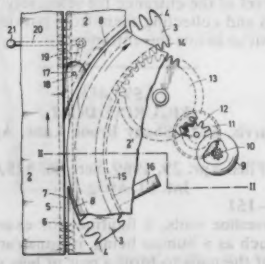
of solder in a loop at one end thereof and secured at its other end to the hand portions of the arm nails.

3,593,456
TOY VEHICLES
Aubrey Robert Mills, Palmers Green, England, assignor to Die Casting Machine Tools Limited, London, England
Filed June 11, 1969, Ser. No. 832,248
Claims priority, application Great Britain, Sept. 24, 1968, 45,355/68
Int. Cl. A63h *11/10*
U.S. Cl. 46—201 **7 Claims**



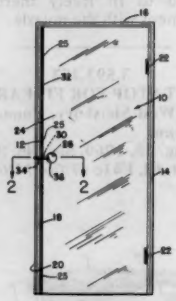
The invention provides a toy vehicle having a resilient plate carrying tabs which straddle an axle and thereby retain it over a metal chassis. The tabs are formed with thin edges where they bear on the axle. This considerably assists the free running of the vehicle.

3,593,457
TOY RAILROAD
Max Ernst, Loherngrinstrasse 14, 85 Nuremberg, Germany
Filed Nov. 14, 1968, Ser. No. 775,596
Claims priority, application Germany, Nov. 15, 1967, E 35 174IC/77f
Int. Cl. A63h *18/00*
U.S. Cl. 46—243 **7 Claims**



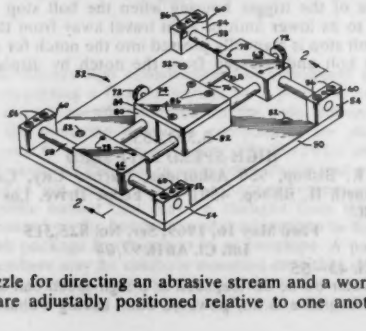
A track system for toys including baseplate means, upper plate means arranged above and in spaced relationship to the baseplate means and provided with at least two grooves each being closed in itself so as to form a closed track adapted to receive follower means of toys. The tracks have at least one section in common with each other. The driving power transmitting means located between the baseplate means and the upper plate means and respectively arranged in alignment with the tracks pertain to different tracks engaging each other at common sections of the tracks. Control means are provided at said common sections and are operable selectively to move from a first position into a second position and vice versa to control the communication from the respective common section to the respective desired adjacent track in the direction of movement of the respective driving power transmitting means pertaining to the respective adjacent tracks. Driving means are drivingly connected to the driving power transmitting means pertaining to at least one of the tracks.

3,593,458
SHIPPING DOOR LOCK
James A. Wahlfeld, Peoria, and Robert C. L. Jacobs, East Peoria, both of, Ill., assignors to Wahlfeld Manufacturing Company, Peoria, Ill.
Filed Nov. 25, 1969, Ser. No. 879,847
Int. Cl. E06b *1/00*
U.S. Cl. 49—380 **12 Claims**



A retainer for a prehung door unit to maintain the squareness and alignment of the door within its frame during shipping and installation which is readily installed in existing lock, latch and keeper openings, having a member mating with the latch opening, and a member, separable or integral therewith mating with the keeper opening and a fastener engageable through the mating members and the door jamb to hold the door in place and releasable for removal of the securing device after installation of the unit.

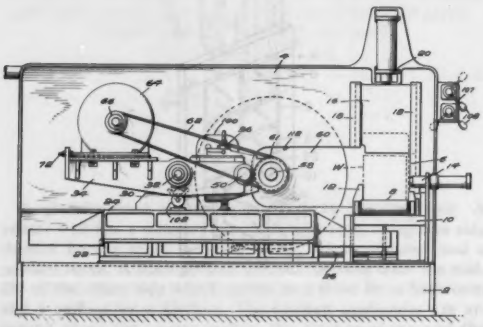
3,593,459
MOVABLE SUPPORT FOR ABRADING APPARATUS
Walter Kulischenko, East Brunswick, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed June 6, 1969, Ser. No. 831,825
Int. Cl. B24c *3/12*
U.S. Cl. 51—8 **2 Claims**



A nozzle for directing an abrasive stream and a workpiece holder are adjustably positioned relative to one another in

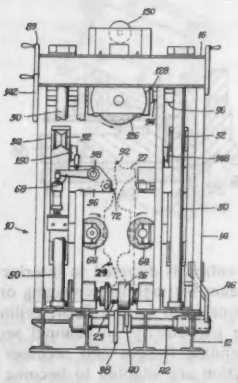
horizontal directions by means of device which supports one or the other by horizontal slide structures that are movable at right angles to each other.

3,593,460
ABRASIVE CUT-OFF MACHINES
James L. Hensley, Clinton, Tenn., assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed June 13, 1968, Ser. No. 736,779
Int. Cl. B24b 7/00, 9/00, 55/02
U.S. Cl. 51—33 R 19 Claims



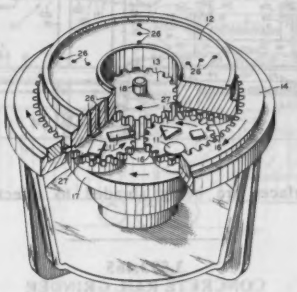
An abrasive cutoff wheel operating at high speed to cut through a bar of hard metal or other material. The rotating wheel is moved into the work while a rocking, as well as a vibrating, motion is imparted thereto. Cooling fluid is circulated over top of the wheel and down to the area of cutting to dissipate the heat of friction, thence to a tank in the base of the machine.

3,593,461
CHAMFERING DEVICE
Alden V. Gay, 1013 Capri Circle, Hueytown, Ala.
Filed May 1, 1969, Ser. No. 820,764
Int. Cl. B24b 5/46
U.S. Cl. 51—88 4 Claims



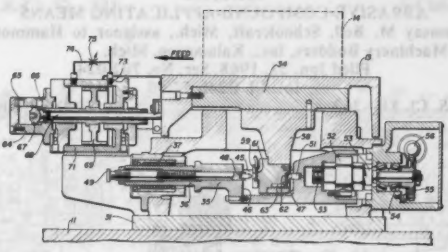
The device automatically rotates and grinds successive railway wheels in the area of the hub and the apex of the flange and thereafter ejects each wheel from the device. The device is adjustable to accommodate various size wheels.

3,593,462
APPARATUS FOR ABRADING ARTICLES
Paul A. Ryll, Haverhill, Mass., assignor to Western Electric Company Incorporated, New York, N.Y.
Filed Mar. 24, 1969, Ser. No. 809,846
Int. Cl. B24b 5/18
U.S. Cl. 51—161 6 Claims



Extremely thin quartz crystal plates are nested in toothed nesting members of still lesser thickness, each of which rests upon a different planetary gear of a planetary gearing assembly. The nesting members conform to the shape of the planetary gears and move with the planetary gears upon the operation of a drive motor. This movement causes the top faces of the nested crystal plates to be lapped against a bottom lapping surface of a nonrotary lapping plate. The top faces of the crystal plates, thus, are lapped into substantially exact parallelism with unaltered bottom faces of the crystal plates.

3,593,463
GRINDING MACHINE
Herbert R. Uhtenwoldt, Worcester; Frederick A. Hohler, Holden, and Richard T. Knorring, Worcester, all of, Mass., assignors to The Heald Machine Company, Worcester, Mass.
Filed Sept. 27, 1968, Ser. No. 763,294
Int. Cl. B24b 49/08
U.S. Cl. 51—165.8 9 Claims

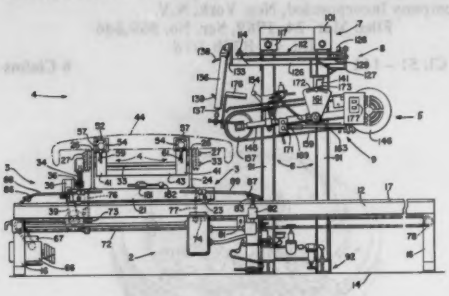


This invention relates to a grinding machine and, more particularly, to apparatus for generating a surface of revolution by the abrasion process, wherein two hydraulic cylinders and a motor-driven screw are provided and combined to operate the machine in three distinct modes; controlled-force, controlled-rate short-throw, and controlled-rate long-throw.

3,593,464
AUTOMOBILE-BUMPER-GRINDING APPARATUS
William A. Bell, 1771 Balsa Ave., San Jose, Calif.
Filed Mar. 10, 1969, Ser. No. 805,721
Int. Cl. B24b 21/16, 47/04
U.S. Cl. 51—143 21 Claims

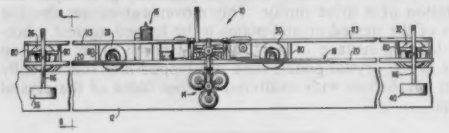
Presented is an automobile-bumper-grinding apparatus on

which an automobile bumper may be supported while its



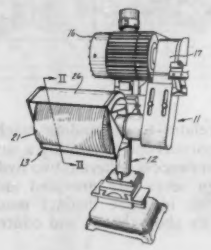
various surfaces are being abraded to effect smoothing thereof.

3,593,465
CONCRETE RAIL GRINDER
James A. Krippes, 1910 E. Jackson St., Pensacola, Fla.
Filed Apr. 1, 1968, Ser. No. 717,563
Int. Cl. B24b *23/00, 7/00, 9/00*
U.S. Cl. 51—178 **23 Claims**



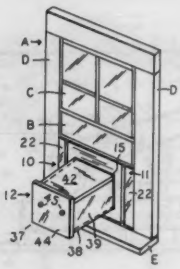
A self-propelled concrete rail-grinding machine including lateral supporting tires and vertical supporting tires. Opposite sides of the rail are ground by opposed sets of grinding cups. Each set of grinding cups includes three cups which rotate about their own axes as the set revolves about a central axis. The lateral supporting tires are spring loaded to bear against the side of the rail.

3,593,466
ABRASIVE-COMPOUND-APPLICATING MEANS
Ramsay M. Bell, Schoolcraft, Mich., assignor to Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Filed Jan. 31, 1968, Ser. No. 702,024
Int. Cl. B24b *57/00*
U.S. Cl. 51—263 **9 Claims**



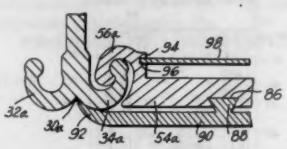
A polishing or buffing machine having a reciprocating abrasive-compound-applicating means adjacent the periphery of the polishing or buffing wheel for applying an abrasive compound thereon. A drive means, preferably including a reciprocating fluid actuated power cylinder and a flexible cable drive, is provided for reciprocating the applicating means along the length of the wheel. The complete drive means is enclosed within a flexible enclosure, such as a bellows, for preventing contamination thereof, such as by the abrasive compound.

3,593,467
RETRACTABLE WINDOW CASE STRUCTURE AND SUPPORT THEREFOR
John P. Francis, 20 Boston St., Haverhill, Mass.
Continuation-in-part of application Ser. No. 855,256, Sept. 4, 1969. This application Mar. 11, 1970, Ser. No. 18,616
Int. Cl. A47g *7/02;* **A47h** *27/00*
U.S. Cl. 52—29 **10 Claims**



This invention provides for a retractable window case structure or container, in the form of a boxlike unit, for removable attachment and adjustable support from a laterally adjustable support removably engaged within an open window area. The adjustable support is provided with at least one laterally movable member for frictional supporting engagement within the window frame area. The case structure is fully supported through an opening formed within the support for movement to either the outside weather or the inside controlled conditions. The device is a protective container for food, small animals, birds, plants and the like.

3,593,468
INTERLOCKING CHANNEL SECTIONS FOR USE IN THE CONSTRUCTION OF FLOORS, CEILINGS, WALLS AND THE LIKE
Leopold Bustin, 194 Emmon Road, Flanders, N.J.
Filed Nov. 5, 1968, Ser. No. 773,395
Int. Cl. E04b *2/18;* **E04c** *2/08*
U.S. Cl. 52—27 **7 Claims**



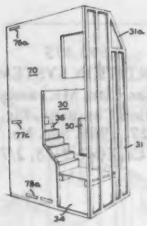
The present invention is directed to interlocking channel sections having means for matingly engaging one another in interlocking relationship to form a floor, ceiling or wall assembly and, more particularly, to channel sections having longitudinally extending flanges and recesses wherein the flanges in one section are adapted to become hingedly engaged in the recesses in an adjacent section to form an interlock therebetween. The invention also contemplates the use of auxiliary closure members in combination with the interlocking channel sections whereby the channel sections may also be employed to provide ventilating, heating, cooling ducts and the like.

3,593,469

PREFABRICATED SERVICE MODULE FOR A DWELLING UNIT

Harlin Joseph Wall, State College, Pa., assignor to General Housing Industries, State College, Pa.

Filed Dec. 9, 1969, Ser. No. 883,379
Int. Cl. A47k 3/16; E04h 1/12
U.S. Cl. 52—27 33 Claims



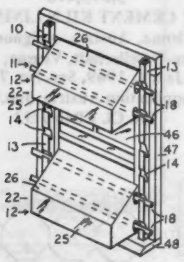
A prefabricated service module for a dwelling unit. A center wall has a stairway extending upwardly along one side thereof having space beneath it for a water heater and a powder room. A floor portion extends laterally from the middle of the other side which serves as a floor for a bathroom and a ceiling for a kitchen. The kitchen appliances are arranged along the center wall in the kitchen space and the bathroom fixtures along the center wall in the bathroom space. The utility systems, such as heating ducts, vent ducts, electric supply, water and sewer systems are provided in the center wall. The entire structure can be completely prefabricated and can even include all of the appliances, plumbing fixtures and the like, so that it can be fully tested out at the point of its manufacture, and thereafter transported to the site of the building into which it is to be incorporated.

3,593,470

COMBINED AWNING AND CASE STRUCTURE

John P. Francis, 20 Boston St., Haverhill, Mass.

Filed Sept. 4, 1969, Ser. No. 855,256
Int. Cl. A47g 7/02; A47h 27/00
U.S. Cl. 52—36 9 Claims



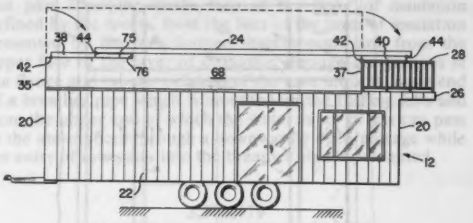
This invention provides for one or more vertically spaced apart case structures or containers, somewhat in the form of boxlike units, to be vertically movable and adjustable adjacent a window or other opening in the wall of a building or the like. Each case structure also serves as an awning, more so when an angled top cover is provided. Each specific case structure is a protective container for food, small animals, birds, plants and the like, and supported from laterally positioned supports removably supported on opposing vertical supports attached to a wall area.

3,593,471

COLLAPSIBLE MULTI-STORY MOBILE HOME STRUCTURE

Eugene R. Fields, Arcadia, Calif., assignor to Haskill H. Grodberg

Filed Oct. 28, 1968, Ser. No. 771,083
Int. Cl. E04b 7/16
U.S. Cl. 52—66 9 Claims



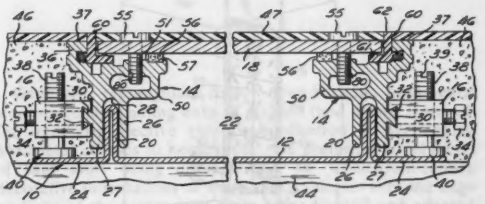
A mobile home structure typically including two sections which are joined together along a vertical plane extending longitudinally through the structure matching doorway and common wall portions of each section. Each section includes a foldable second level portion having a roof which is pivotally attached to be raised and lowered on two hinged opposite wall portions. The foldable portion of the second level has removable sidewall panels adapted to be inserted between the roof and a fixed lower portion of the sidewall, with one of the sidewall panels being dimensioned to interlock against longitudinal movement.

3,593,472

TRENCH DUCT

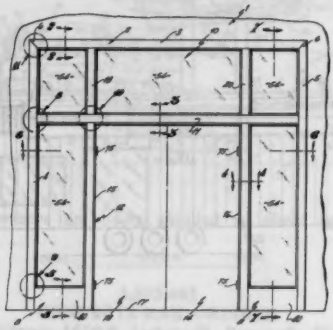
Paul R. Bargar, Novelty; Charles E. Shirer, Broadview Heights, and John P. Penczak, North Olmstead, all of, Ohio, assignors to Bargar Metal Fabricating Company, Cleveland, Ohio

Filed Apr. 25, 1967, Ser. No. 633,560
Int. Cl. E04b 5/48; E04f 17/08
U.S. Cl. 52—221 5 Claims



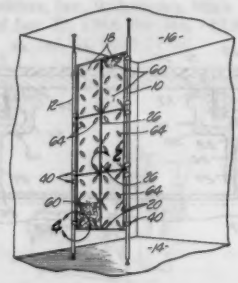
An underfloor electrical trench duct has a bottom channel member with adjustable height side rails and a removable cover plate. A reversible trim strip which snaps into different grooves in the side rails provides a moisture seal between the cover plate and the side rails during construction and in the finished floor as well as a decorative trim strip between the covering on the cover plate and that on the surrounding floor. The cover plate fastening arrangement includes a fastener slot extending the length of each side rail for receiving cover plate fasteners at any point along the length of a duct section.

3,593,473
SECTIONAL SIDE LIGHT DOOR FRAME
Donald L. King, Loveland, Ohio, assignor to The Steelcraft Manufacturing Company, Cincinnati, Ohio
Filed May 28, 1969, Ser. No. 828,638
Int. Cl. E06b 1/12
U.S. Cl. 52—204 8 Claims



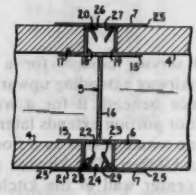
A sectional sheet metal frame for doors consisting of a main frame mounted within a wall opening in which vertical side light panels and a horizontal transom panel, formed of glass, are mounted within the main frame. A secondary door frame, consisting of vertical jambs and a horizontal header, is mounted in spaced relationship within the main frame. The frame assembly is furnished to the user in prefabricated sections and the several sections include connecting devices, whereby the main frame is installed within the wall opening, then the secondary door frame, consisting of the vertical door jambs and a horizontal header is installed, with the ends of the vertical jambs resting upon the floor and connected to sills, which are anchored to the floor.

3,593,474
MEANS FOR SUBDIVIDING AN OCCUPIABLE SPACE
Michael M. Neels, 3732 Keystone Ave., Apt. 9, Los Angeles, Calif.
Filed May 12, 1967, Ser. No. 638,025
Int. Cl. E04c 2/40
U.S. Cl. 52—239 1 Claim



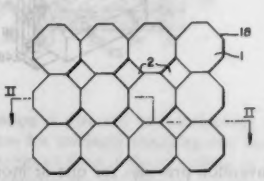
Means for dividing a room into a plurality of areas, such means comprising a series of preferably latticed panels supported by vertical support elements, preferably removably secured, extending between the ceiling and the floor, and on which elements are provided a plurality of clamping devices, serving to hold the panels fixedly in relation to the vertical support elements. The clamping devices are adjustably movable on the vertical elements. These clamping devices are designed to be tightened by a tap screw, and upon tightening, not only are thereby secured in a fixed position on their respective vertical elements, but also serve to grip the edges of decorative panel members, one or more of which extend most of the distance between a pair of vertical support elements. The decorative panel members may assume many forms but preferably are latticed with areas to receive plastic colored inserts which may be snapped into the portion of the lattice defining such areas, but are removable therefrom. Special plastic tubular fastening devices are employed to secure together in abutment the edges of a pair of panel members.

3,593,475
PARTITION SYSTEM
David H. LaGue, Kansas City, Mo., assignor to The Glen O'Brien Movable Partition Company, Inc., Kansas City, Mo.
Filed Jan. 27, 1969, Ser. No. 794,077
Int. Cl. E04b 2/28, 2/78
U.S. Cl. 52—241 4 Claims



A partition system extending between a floor surface and a ceiling surface comprises a plurality of pairs of laterally spaced wall-defining panel units extending between upright joint-framing members which engage facing edge portions of adjacent panel units. Snap-on retainer-cover members are mounted on the joint framing members and engage the facing edge portions of the adjacent panel units. Ceiling, floor, and end framing members engage and position upper, lower, and end edge portions, respectively, of the panel units. The edge member at the ceiling surface receives and retains a resilient clip therein which cooperates with the ceiling edge member to engage and retain the upper edge portions of the panel units.

3,593,476
ROTARY CEMENT KILN LINING BRICK
Friedrich Hodl, Vienna, Austria, assignor to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria
Filed Jan. 6, 1969, Ser. No. 789,298
Claims priority, application Austria, Jan. 5, 1968, A 157/68
Int. Cl. E04b 1/32
U.S. Cl. 52—249 2 Claims



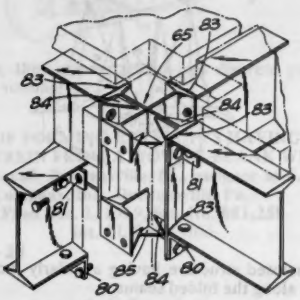
Refractory bricks for rotary cement kiln linings have beveled edges, and adjoining beveled edges of adjacent bricks in the lining form channels open toward the hot inner face of the lining to facilitate anchoring of the coating formed during operation of the kiln.

3,593,477

REINFORCED CONCRETE COLUMNS OR BEAMS

Martin H. Briggs, London, England, assignor to Sanders and Forster, Limited, London, England

Filed Jan. 16, 1969, Ser. No. 791,699
Claims priority, application Great Britain, Jan. 23, 1968, 3566/68
Int. Cl. E04b *1/41*; E04c *3/20, 3/34*
U.S. Cl. 52—253 5 Claims



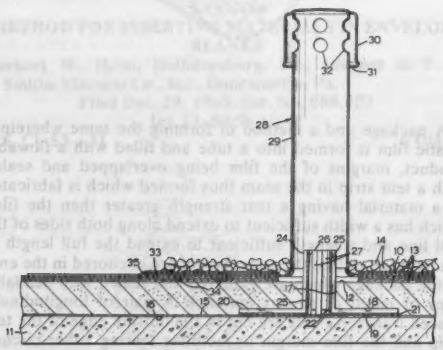
This application discloses a reinforced concrete beam or column having side attachment means for a further beam or column and comprising an anchor member which is short relative to the beam or column, which is embedded in the concrete and which has at least one plane surface in the plane of a sideface of the beam or column and having bolt holes for fixing bolts for the further beam or column.

3,593,478

ROOFING INSTALLATION

Robert W. Mason, Port Credit, Ontario, Canada, assignor to Marathon Equipment & Supply Limited, Weston, Ontario, Canada

Filed Dec. 12, 1969, Ser. No. 884,405
Int. Cl. E04b *1/70*
U.S. Cl. 52—302 16 Claims



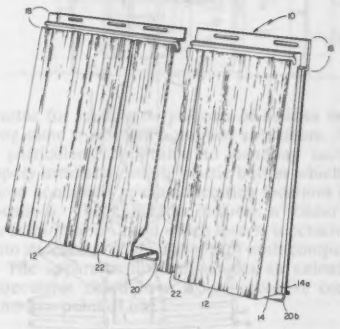
A roofing installation in which spaced holes are formed through a layer of fibrous or closed-cell thermal insulation and through bitumen-coated roofing felts which have an upper layer of gravel chips and which are disposed on top of the layer of insulation. The lower face of the layer of insulation, between which and a supporting concrete roofing deck a vapor barrier layer is disposed, is recessed around each hole, and a breather core comprising a tubular portion and an annular flange portion presented at the lower end of the tubular portion is disposed with the tubular portion snugly fitted within the hole and with the flange portion disposed within the recess on the lower face of the layer of insulation. The flange portion of the core is of castellated form, the grooves constituted by the castellations each being of truncated sector-shaped form. The tubular portion of the core is also of castellated form with the grooves constituted by these castellations being disposed parallel to the vertical, longitudinal axis of the tubular portion, the grooves on the outer face of the tubular portion each being in communication with one of the grooves on the upper face of the flange portion, and the grooves on the inner face of the tubular portion each being in communication with one of the grooves on the lower face of the flange portion. Thus, water vapor, gas and the like can pass from the lower face of the layer of insulation defined by the recess, from the face of the layer of insulation presented by the hole formed therethrough, and from the upper face of the layer of insulation through the grooves in the flange and tubular portions of the core into the lower end of a breather pipe which is mounted on the roofing felts and from the upper end of which the water vapor or gas can pass to the atmosphere through a downwardly open passage while the entry of rainwater into the breather pipe is prevented.

3,593,479

MOLDED PLASTIC SIDING UNITS

Caryl E. Hinds, Norwood, and James W. Jackson, East Walpole, both of, Mass., assignors to Bird & Son, Inc., East Walpole, Mass.

Filed Jan. 31, 1969, Ser. No. 795,509
Int. Cl. B44f *9/02*
U.S. Cl. 52—313 3 Claims



Generally rectangular, hollow-open-backed, ornamental wood-simulating siding units of molded rigid plastic material, for weather-protective exterior application in overlapping horizontal courses to houses, etc., the preferred novel forms of said units being characterized by wood-grain-replica decorative indentations of wood shake shingles with the edge portions of the rectangular units being formed and adapted to overlap and interlock with other like units, of the same and adjacent courses, to prevent ingress of rain and wind-lifting of the offset weather-exposed butts thereof.

3,593,480

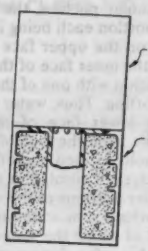
PLASTIC SHELL CONSTRUCTION BLOCK

Jerry L. Bouchillon, 2329 Amy Ave., Kingsport, Tenn.

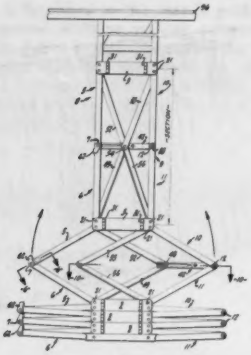
Filed July 23, 1969, Ser. No. 853,583
Int. Cl. E04b *2/18*; E04c *2/20*
U.S. Cl. 52—415 19 Claims

A construction block and block assembly thereof is disclosed comprising a formed, finished appearing plastic shell having cavities filled with cementitious material which are separated by pocket means to provide dead air or insulating

spaces, having a chemical composition adaptable to fire proofing, resistance to moisture permeation, resistance to rotting and other deterioration, and having high-strength characteristics when filled with said cementitious material.



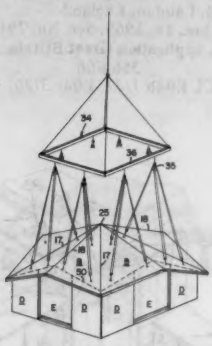
3,593,481
EXTENSIBLE STRUCTURE
Tom T. Mikulin, 1469 Bellevue Ave., Burlingame, Calif.
Filed Mar. 19, 1969, Ser. No. 808,603
Int. Cl. E04h *12/34*; E01d *15/10*
U.S. Cl. 52—632 7 Claims



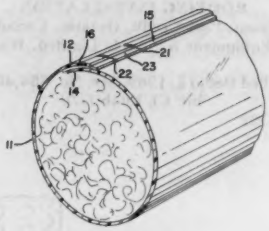
A structure adapted to be extended from a compact form to a greatly elongated form to provide a vertically extending tower or a horizontally extending bridge or the like. The main structural members are similar to lazy tongs and the sides of the structure are formed of pivotally connected panels adapted to be nested in side by side relation in the compact form and opened into coplanar relationship in the extended form. Locking means is provided for fixedly connecting the extended sections together to provide the equivalent of a rigid structure.

3,593,482
PROCESS FOR ERECTING FOLDING SLAB CONSTRUCTION
Delp W. Johnson, 240 Oakview Drive, San Carlos, Calif.
Filed Dec. 12, 1968, Ser. No. 783,236
Int. Cl. E04b *1/344*; E04g *21/14*
U.S. Cl. 52—745 8 Claims

A building structure and construction process in which four or more individual slabs are formed and hingeably joined in coplanar relation. Thereafter the slabs are simultaneously raised, folded and braced in an erect position to form an enclosed structure having angularly inclined ridges and valleys along the folded seams.



3,593,483
METHOD OF FORMING A PACKAGE WITH EASY OPENING DEVICE
Alan C. Tracy, Davenport, Iowa, assignor to The Kartridg Pak. Co., Davenport, Iowa
Division of Ser. No. 730,411, May 20, 1968, Pat. No. 3,497,131.
This application July 28, 1969, Ser. No. 845,201
Int. Cl. B65b *61/18*
U.S. Cl. 53—14 3 Claims

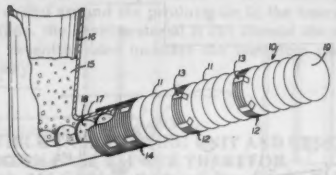


A package and a method of forming the same wherein a plastic film is formed into a tube and filled with a flowable product, margins of the film being overlapped and sealed with a tear strip in the seam thus formed which is fabricated of a material having a tear strength greater than the film, which has a width sufficient to extend along both sides of the seal line and a length sufficient to extend the full length of the package so that the ends thereof are anchored in the ends of the package which are gathered and sealed with bendable clips of metal or similar material. A pair of longitudinally spaced transverse slits are cut in the outside edge of the tear strip and the film margin to facilitate tearing either circumferentially or longitudinally so as to open the package.

3,593,484
METHOD AND APPARATUS FOR SEQUENTIALLY PACKAGING MATERIALS INTO UNITS OF DESIRED VOLUME
Joseph A. Dussich, 15-09 215th St., Bayside, N.Y.
Division of Ser. No. 774,368, Nov. 8, 1968. This application Mar. 23, 1970, Ser. No. 21,766
Int. Cl. B65b *1/24*, *63/02*
U.S. Cl. 53—24 18 Claims

This method and apparatus employs an elongated axially compressed material having alternate axial portions which

are secured and unsecured against axial expansion. The containers are filled sequentially, and subsequently, at any



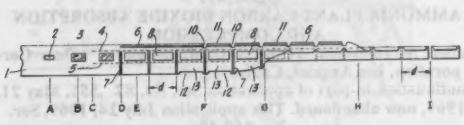
desired time, they are separated into discrete packages of prearranged volume.

3,593,485

METHOD OF FORMING ENVELOPES HAVING INSERTS THEREIN FROM A MOVING BLANK WEB

Milton A. Stovall, Duncansville, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Dec. 1, 1969, Ser. No. 881,258
Int. Cl. B65b *9/06*
U.S. Cl. 53—28 **6 Claims**



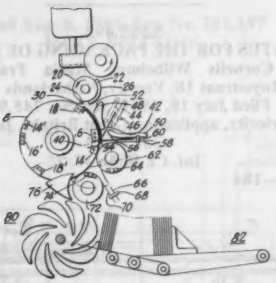
A method of forming envelopes having inserts therein from a continuously moving web of uniform width. The web is advanced along a line at selected forward speeds, continuously gummed along one edge to form an adhesive strip parallel to that edge, gummed at selected spaced intervals to form adhesive strips beginning at the web's opposite edge and extending in a direction normal to the continuous adhesive strip, inserts are placed on the gummed moving web, marginal cuts are made along both edges of the moving web to form bottom and closure flaps which are successively folded and sealed to form a moving web of discretely packed insert materials which is cut transversely of its direction of travel along the spaced adhesive strips to form envelopes having inserts sealed therein.

3,593,486

METHOD FOR INSERTING MATERIALS IN ENVELOPE BLANKS

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Co., Inc., Duncansville, Pa.

Filed Dec. 29, 1969, Ser. No. 888,452
Int. Cl. B65b *11/48*
U.S. Cl. 53—31 **6 Claims**



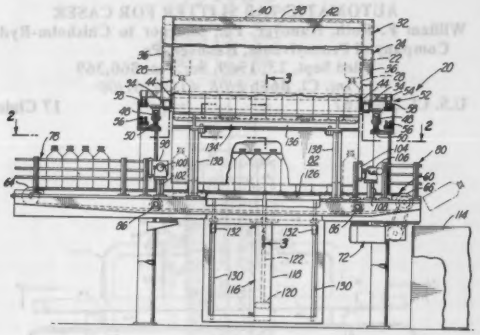
Methods of enclosing insert materials in continuously advancing envelope blanks and forming mailing pieces comprising an envelope having insert materials sealed therein wherein the insert materials are enclosed and sealed in an envelope blank during the envelope formation process. An envelope blank having closure flap, body and bottom flap portions is contacted with a rotating cylinder having vacuum and pressure ports. A negative pressure is formed at the vacuum ports for maintaining the envelope blank in overlying contacting relationship with the cylinder. A positive pressure is formed at the pressure ports for urging the bottom flap portion of the blank away from the rotating cylinder to form a fold between the bottom flap and body portions of the envelope blank. Insert materials are injected into the fold thus formed and the bottom flap portion is thereafter folded into overlying contacting relationship with the body portion of the blank to enclose the insert materials therein. The envelope blank has adhesive strips applied thereto as required and is folded and sealed to form an envelope having insert materials sealed therein.

3,593,487

ARTICLE-HANDLING APPARATUS

Keith B. Cleland, Whittier, Calif., assignor to Hunter Industries, Santa Fe Springs, Calif.

Filed Feb. 14, 1969, Ser. No. 799,480
Int. Cl. B65b *5/10, 57/14*
U.S. Cl. 53—54 **6 Claims**



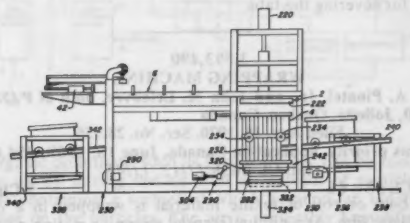
An apparatus for loading tiered rows of articles into and for unloading same from open-bottomed containers. The apparatus is particularly applicable to handling such light weight, slippery articles as empty plastic bottles which are to be loaded into containers at manufacturing locations for use at other locations. The apparatus includes a loader which forms the articles into rows and which inserts successive rows upwardly into successive compartments of multicompartment containers. The apparatus further includes an unloader for removing successive tiered rows from successive container compartments at a point of use.

3,593,488

CONTAINER-LOADING APPARATUS

Albert H. Merkner, Pittsburgh, and Chester L. Gutowski, Castle Shannon, both of, Pa., assignors to H. J. Heinz Company, Pittsburgh, Pa.

Filed Aug. 2, 1968, Ser. No. 749,813
Int. Cl. B65b *57/10, 35/30*
U.S. Cl. 53—61 **10 Claims**



Apparatus for loading metallic containers into a container receiver. A magnetic container-loading head adapted to receive containers from first conveyor means and transfer the containers to the container receiver. Second conveyor means

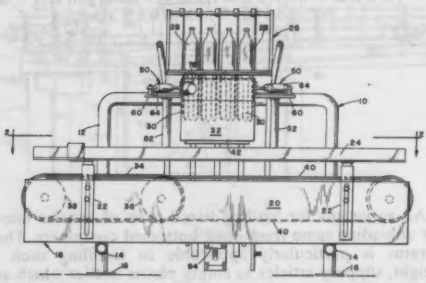
for supplying containers to the first conveyor means. Control means intermittently terminating the supply of said containers from the second conveyor means to the first conveyor means. Third conveyor means for transporting container receivers to a loading position under the magnetic container-loading head and subsequently away from the underlying position. Positioning means for establishing relative vertical movement between the magnetic container-loading head and the container receiver. Release means responsive to the relative vertical positioning of the magnetic container-loading head and the container receiver to release the containers from the former and transfer them to the latter. The first conveyor means may have a stationary container-receiving table and a reciprocating walking beam assembly with pusher means to move the containers received on the stationary table from he second conveyor means to the walking beam. Pattern-forming means operating responsive to movement of said pusher means to produce lateral nesting movement of the containers and means for raising and lowering the walking beam assembly.

3,593,489

AUTOMATIC TAB SLITTER FOR CASER

William F. Roth, Hanover, Pa., assignor to Chisholm-Ryder Company of Pennsylvania, Hanover, Pa.

Filed Sept. 23, 1969, Ser. No. 860,369
Int. Cl. B65b *5/08, 43/26, 61/00*
U.S. Cl. 53—167 **17 Claims**



Mechanism for severing tabs connected to adjacent edges of certain flaps of a shipping case to be packed with containers or the like in connection with casing operations, said tabs holding the upper flaps of a caser closely against the outer surfaces of the sides and ends of a case incident to being loaded. The caser includes mechanism to elevate the cases successively to loading mechanism and incident to such elevation, tab-severing means are positioned to engage the tabs to sever the same and thereby permit the flaps to be closed as a subsequent operation. The tab-severing mechanism includes units respectively movable diagonally toward and from opposite corners of a case where the tabs are located and include rotatable serrated cutters which are power-driven. Fluid-operated means also move said cutter units laterally toward said corners of a case to position the same for severing the tabs.

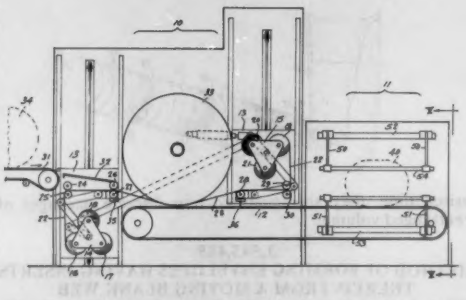
3,593,490

WRAPPING MACHINE

John A. Pinatel, Jr., and John M. Lefebvre, both of P.O.Box 490, Joliette, Quebec, Canada

Filed Apr. 15, 1970, Ser. No. 28,756
Claims priority, application Canada, June 18, 1969, 054,663
Int. Cl. B65b *11/12, 11/48*
U.S. Cl. 53—66 **5 Claims**

A bale or roll of textile material is wrapped in a thermoplastic film. At a circumferential wrapping station a frame carrying film is raised to cause a web of film to embrace the sides of the workpiece; rollers which move together at the top of the workpiece carry heat-sealing and severing bars to complete the circumferential wrap and to rejoin the film to form an uninterrupted web for the next workpiece. At a subsequent end-wrapping station, arms bearing heat-sealing and severing bars are closed to complete the wrap. The operations are sequenced to follow automatically upon each other,



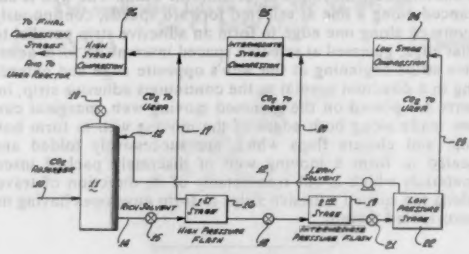
the circumferential wrapping operation serving to measure the height of the workpiece and store this information for use in adjusting the operation height of the heating bars in the end-wrapping operation.

3,593,491

AMMONIA PLANT CARBON DIOXIDE ABSORPTION AND COMPRESSION

Robert N. Tennyson, Anaheim, Calif., assigno Fluor Corporation, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 82 ,551, May 21, 1969, now abandoned. This application July 24, 1969, Ser. No. 850,306
Int. Cl. B01d *19/00, 53/00*
U.S. Cl. 55—43 **1 Claim**



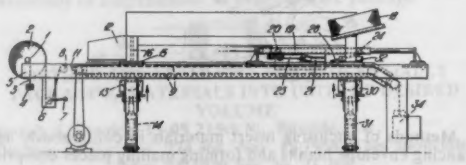
Carbon dioxide is recovered by dissolution in a physical solvent under relatively high contactor pressure which is conserved for purposes of carbon dioxide delivery to a urea plant by incremental or stage pressure reduction of the rich solvent flowing through a succession of separation zones from which their respective gas releases are progressively combined and compressed as feed to the urea reactor.

3,593,492

APPARATUS FOR THE PACKAGING OF PRODUCTS

Arnodous Cornelis Wilhelmus Maria Frankefort, Min. Charles Ruysstraat 18, Venray, Netherlands

Filed July 18, 1968, Ser. No. 745,942
Claims priority, application Great Britain, July 20, 1967, 33474/67
Int. Cl. B65b *47/02*
U.S. Cl. 53—184 **24 Claims**



The invention relates to apparatus for packaging products and having a continuous conveyor with an intermittent step-by-step movement and which conveys a film of thermoplastic

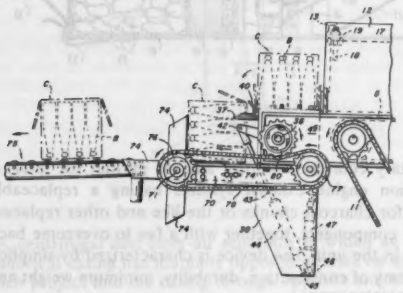
sheet material. This material is softened by heat or any other way, shaped into a series of depressions into which products may be placed. Cardboards are automatically fed into position and placed over the depressions in the thermoplastic material and sealed around the products on to the board and, at the same time, the sheet material is cut around the sealed portion. The invention also includes the complete package made in this way.

3,593,493

CONVERTIBLE CASE PACKING UNIT AND UPSIDE-DOWN CASE PACKER THEREFOR

Frank P. Alduk, 116 Guadalcanal Road, New Castle, Pa.

Filed Feb. 3, 1969, Ser. No. 796,092
Int. Cl. B65b *5/06; B65h 21/22; B65b 35/54*
U.S. Cl. 53—243 **9 Claims**



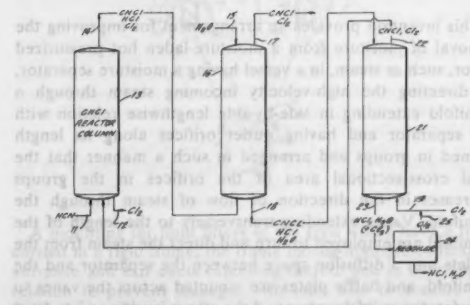
There is disclosed a basic case-packing unit that is convertible for use with interchangeable case-packing units of various types, and an upside-down case packer for use thereon. The basic unit comprises a frame with an endless conveyor belt that receive containers and container-shaped articles at one end, and arranges them in a predetermined arrangement for removal at the discharge end over a dead plate flush with the top reach of the belt. projecting frame structures at the discharge end of the belt provide support for various case-packing units that can be interchangeably mounted thereon. An upside-down case packer for mounting on the projecting frame structures is also disclosed.

3,593,494

PROCESS FOR THE SEPARATION OF GASEOUS MIXTURES OF CYANOGEN CHLORIDE AND HYDROGEN CHLORIDE

William S. Durrell, and Robert J. Eckert, Jr., both of Mobile, Ala., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Filed Aug. 8, 1968, Ser. No. 751,197
Int. Cl. B01d *53/14*
U.S. Cl. 55—51 **6 Claims**



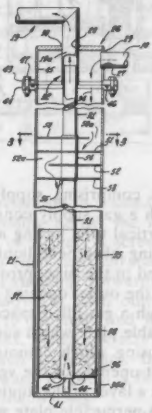
Process for the separation of hydrogen chloride from gaseous mixtures incorporating the same in admixture with cyanogen chloride, involving absorption of the hydrogen chloride in water followed by stripping of the aqueous bottoms from the absorber to remove residual cyanogen chloride from the HCl-containing stream and thus facilitate the recovery of HCl in economically attractive concentrations. The process permits such recovery without substantial concomitant loss of the cyanogen chloride product by hydrolysis.

3,593,495

A METHOD FOR GAS PURIFICATION FROM A SYSTEM RETORT

John M. Ellison, Sherman Oakes, Calif., assignor to Vacuum Atmospheres Corporation, North Hollywood, Calif.

Filed June 19, 1969, Ser. No. 834,653
Int. Cl. B01d *39/00*
U.S. Cl. 55—68 **4 Claims**



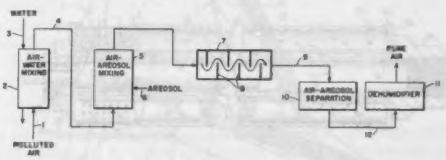
The disclosure concerns the operation of a gas purification retort unit wherein removal of a gas flow tube and getter carrier from a heated container are facilitated, and the mode of operation of the tube and baffle structure carried thereby are such that heat transfer from hot gas to a sealed interconnection between the container and a removable head is blocked. Operation of the retort unit in a system for treating gas containing oxygen, hydrogen and water is also disclosed.

3,593,496

METHOD FOR PURIFYING GASES

Edward W. Merrill, Cambridge, Mass., assignor to Charles River Foundation, Boston, Mass.

Filed Sept. 10, 1969, Ser. No. 856,765
Int. Cl. B01d *53/06*
U.S. Cl. 55—77 **7 Claims**



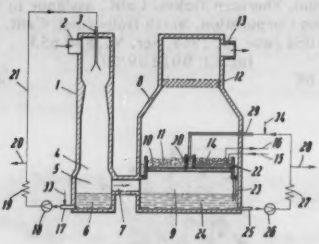
Organic pollutants, such as hydrocarbons, can be removed from air by mixing the air with an aerosol of particles of water containing a surfactant which presents an oleophilic surface on the particles. The air is preferably humidified to 100 percent RH prior to mixing it with the aerosol, so that evaporation of the aerosol particles will not occur. The aerosol particles are effective by absorbing organic pollutants into their oleophilic surfaces, and removal of the particles by filtration or electrostatic precipitation leaves the air substantially purified of such pollutants.

3,593,497

ABSORPTION PROCESS

Hugo Grimm, Frankfurt am Main, and Karl-Heinz Dorr, Mainz, (Rhine), both of, Germany, assignors to Metallgesellschaft A.G., Frankfurt, Main, Germany

Filed Jan. 28, 1969, Ser. No. 794,509
Claims priority, application Germany, Feb. 3, 1968, P 17 19 559.4
Int. Cl. B01f *3/04*
U.S. Cl. 55—250 11 Claims



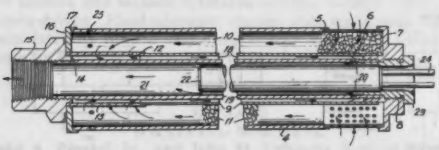
Absorption process comprising supplying SO_3 or water containing gas through a gas supply conduit disposed in the upper portion of a vertical tube having an outlet opening at its lower end; supplying absorbent liquid through a liquid supply conduit disposed in the tube, providing a bath of said liquid disposed below the outlet opening of the tube, passing unabsorbed gas through a gas-filled space, disposed below a horizontal, gas-permeable plate which succeeds the tube and is contained in a housing which communicates with a gas space below the outlet opening of the vertical tube, through said plate and through a layer of the liquid disposed on top of and carried by the gas-permeable plate which layer of liquid is agitated by said gas flowing through the gas permeable plate and through the liquid thereon, discharging the liquid from said layer; and venting unabsorbed gas through a gas outlet opening in the upper portion of the housing.

3,593,498

AIR DRIER AND FILTER

Albert L. Semon, 11 Eliot Place, Short Hills, N.J.

Filed Jan. 21, 1969, Ser. No. 792,730
Int. Cl. B01d *53/26*
U.S. Cl. 55—267 6 Claims



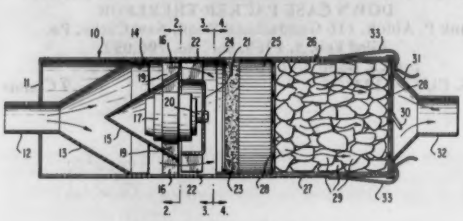
An air drier and filter wherein the air enters through a perforated metal filter in the sidewall and at one end of a casing, said air flowing longitudinally of said casing from the perforated metal filter through an annular mass of a desiccating agent to the opposite end of the casing where it passes laterally through a porous metal filter into an annular passage to flow toward the inlet end of the casing where it flows laterally into a heated chamber leading to a center outlet of the casing.

3,593,499

EXHAUST MUFFLER AND PURIFIER

Herbert E. Kile, Hagerstown, Md., assignor to Richard D. Myerly; Gene A. Cook; James E. Hurd; William G. Price, Hagerstown, Md.; William E. Cale and Virgel M. Cale, Jr., Hot Springs, Va., part interest to each

Filed Apr. 11, 1969, Ser. No. 815,385
Int. Cl. B01d *50/00*
U.S. Cl. 55—267 1 Claim



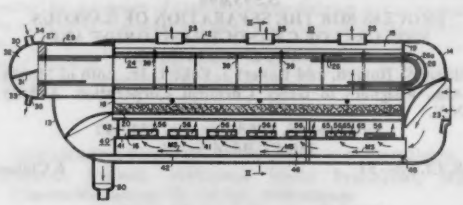
A unitary combined muffler and air purifier for internal combustion engine exhaust systems having a replaceable canister for charcoal chunks or the like and other replaceable filter components, together with a fan to overcome back pressure in the unit. The device is characterized by simplicity, economy of construction, durability, minimum weight and ease of maintenance.

3,593,500

DEVICE FOR SEPARATING MOISTURE-LADEN VAPOR

Paul D. Ritland, Secane, and Eugene J. Barsness, Broomall, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 25, 1968, Ser. No. 778,672
Int. Cl. B01d *45/08*
U.S. Cl. 55—319 5 Claims



This invention provides an arrangement for improving the removal of moisture from a moisture-laden hot pressurized vapor, such as steam, in a vessel having a moisture separator, by directing the high-velocity incoming steam through a manifold extending in side-by-side lengthwise relation with the separator and having outlet orifices along its length formed in groups and arranged in such a manner that the total cross-sectional area of the orifices in the groups decreases in the direction of flow of steam through the manifold. Vanes extending transversely to the length of the manifold are employed to turn and direct the steam from the outlets into a diffusion space between the separator and the manifold, and baffle plates are mounted across the vanes to prevent direct infringement of the steam issuing as jets from the orifices.

3,593,501

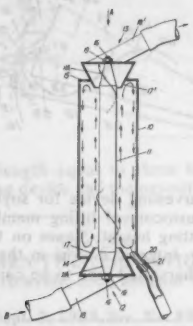
DEVICE FOR SEPARATING PARTICULATE MATERIAL FROM A MIXTURE OF PARTICULATE MATERIAL AND FLUID

Antony D. Cameron, Aberdeen, England, assignor to Aberdeen Engineering Design Limited, Aberdeen, England

Continuation-in-part of application Ser. No. 725,868, May 1, 1968, now abandoned. This application Dec. 19, 1969, Ser. No. 886,462

Int. Cl. B01d *45/12*

U.S. Cl. 55—338 2 Claims



A centrifugal dust-from-air separator in which an upright cylindrical casing has mutually opposed nozzles on each end which project into the casing through opposite end walls and are convergent towards the interior of the casing. A guide member extends along the axis of the casing and enters the mouth of the nozzles so that swirling air and dust mixture entering one nozzle induce a secondary recirculating airflow in the casing, dust moving into the secondary flow under centrifugal force and being deposited at the lower end of the casing and clean air leaving by way of the upper nozzles.

3,593,502

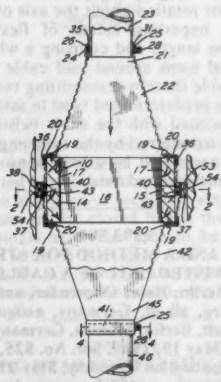
MOUNTING FOR FLUID FILTERS

Michael H. Pelosi, Jr., Broomall, Pa., assignor to CRS Industries, Inc.

Filed May 31, 1966, Ser. No. 553,841

Int. Cl. B01d *46/00*

U.S. Cl. 55—481 2 Claims



A mounting for fluid filters of the type which have a filter carried in a rigid frame, the frame having nonrigid or flexible entrance and exit ducts extending thereto and in overlapped relation to prevent leakage, with seals also to confine the fluid to be filtered, the outer ends of the ducts being detachably connected into a duct system and when detached being movable toward and away from the filter for purposes of installation and changeover.

3,593,503

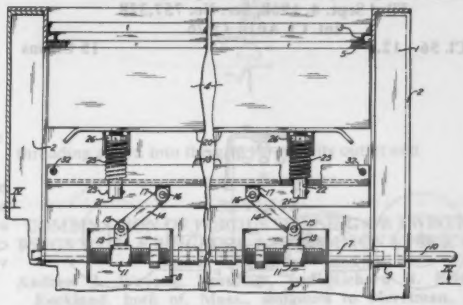
SIDE-LOADING FILTERING APPARATUS

Paul D. Andrews, Dormont, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed May 27, 1969, Ser. No. 828,206

Int. Cl. B01d *27/08*

U.S. Cl. 55—481 5 Claims



Filter-clamping mechanism in a side-loading filter housing includes means extending across the housing for applying pressure to the back of a filter. A screw behind such means and parallel to it has right- and left-hand threads on which nuts are mounted. Extending forward from the nuts and inclined laterally relative to each other are links that are pivotally connected to the nuts and the pressure-applying means on vertical axes. When the screw is turned to cause the links to approach parallelism, the pressure-applying means is moved forward to press a filter against a sealing flange in the front of the housing.

3,593,504

FREE-CUTTING MOWING MACHINE

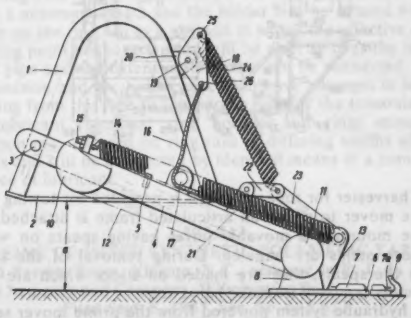
Karl-Heinz Konig, and Antonius Huntrup, both of Essen, Germany, assignors to Landmaschinenfabrik Essen G.m.b.H, Essen, Germany

Filed Jan. 30, 1969, Ser. No. 795,168

Claims priority, application Germany, Jan. 31, 1968, Feb. 2, 1968, P 16 32 812.4;P 16 32 813.5

Int. Cl. A01d *35/26*

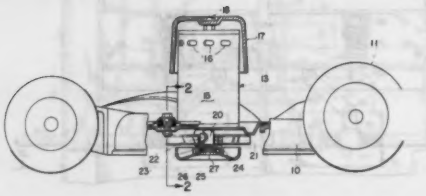
U.S. Cl. 56—6 8 Claims



A free-cutting mowing machine especially a mowing machine comprising a main frame and a trailing beam pivotally carried on one end thereof on the main frame. A mowing beam is pivotally connected to the other end of the trailing beam and cutting discs rotate about vertical axes and are carried by the mowing beam. A first spring operatively

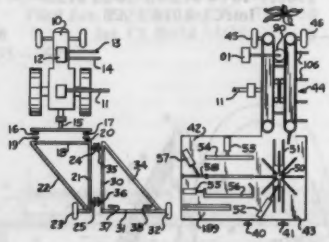
connects the mowing beam with the trailing beam and a second spring operatively connects the mowing beam with the main frame. A tensioning device connects in its operative length to the mowing beam and to the main frame via the trailing beam such that the load of the mowing beam is equalized in a transporting position at least partly for the purpose of an easy, high raising.

3,593,505
MOWER MOTOR COOLING SYSTEM
Robert A. Mittelstadt, Burnsville, Minn., assignor to Toro Manufacturing Corporation, Minneapolis, Minn.
Filed Sept. 4, 1968, Ser. No. 757,328
Int. Cl. A01d *35/26*
U.S. Cl. 56—12.8 **15 Claims**



A cooling system for the electric motor of an electric rotary mower. The system includes a fan which is mounted on the mower shaft under the deck of the housing so as to be enclosed in said housing together with the cutter blade which is also mounted on the motor shaft. The fan draws cooling atmospheric air into the upper end portion of the motor and downwardly through the motor into the blade housing.

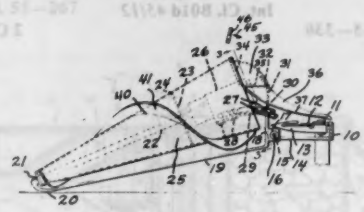
3,593,506
TOBACCO PLANT HARVESTER
James H. Casada, and Edward M. Smith, both of Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.
Filed Aug. 21, 1969, Ser. No. 851,891
Int. Cl. A01d *45/16*
U.S. Cl. 56—27.5 **12 Claims**



A harvester for tobacco plants is provided for towing by a prime mover to which an articulated frame is attached, the frame mounting a movable turret having spears on which tobacco stalks are impaled. During removal of the stalks from the spears, they are loaded on sticks which are then manually removed from the harvester.

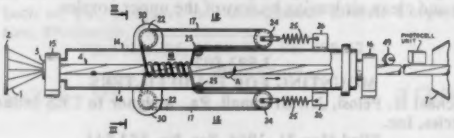
A hydraulic system powered from the prime mover serves to actuate each of the turrets, an empty stick supplying mechanism, a loaded stick removing mechanism, and the mechanism for transferring stalks from the spears to the sticks; and a mechanical power takeoff shaft driven by the prime mover drives the conveyor which moves stalks after being cut from their root systems to the turret for impaling on the spears.

3,593,507
DEVICE FOR GATHERING SOYBEAN CROPS
William F. Mohr, Laurel, Nebr.
Filed June 5, 1967, Ser. No. 644,452
Int. Cl. A01d *45/02*
U.S. Cl. 56—119 **2 Claims**



An improved harvesting device for soybeans or the like having rotating frustoconical lifting members to raise the bean vine to a cutting height. Vanes on the conical shape assist in the lifting. Internal motors in the cones provide a clear path for the harvested vine to be carried into the harvesting machine.

3,593,508
APPARATUS FOR IMPARTING A PREDETERMINED VALUE OF TWIST TO A MATERIAL
Ludwik Jachimowicz, Elizabeth, and Adolf S. Knott, Roselle, both of, N.J., assignors to General Cable Corporation, New York, N.Y.
Filed May 23, 1968, Ser. No. 731,454
Int. Cl. D07b *7/02*
U.S. Cl. 57—34 **11 Claims**

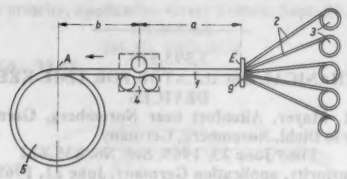


An apparatus for imparting a predetermined twist to a multistrand cable during takeup in which a cable twisting unit is mounted for rotation about the axis of said cable and includes a twist imparting means of flexible cylindrical material of endless length and coursing a winding path of a plurality of helical turns around said cable and in engagement with said cable thereby transmitting twist force to said cable to provide a predetermined twist in said cable. A braking means is associated with the cable twisting unit to vary the twisting force transferred by the twist imparting means to the cable and is controlled by a twist sensor sensing variations from the predetermined twist.

3,593,509
APPARATUS AND A METHOD FOR STRANDING A TWISTED UNIT OF A CABLE
Wolfgang Feese, Berlin; Heinz Oberender, and Heinz Badura, Neustadt/Colburg, all of, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany
Filed May 19, 1969, Ser. No. 825,647
Claims priority, application Germany, May 21, 1968, P 17 65 452.3
Int. Cl. H01b *13/02*
U.S. Cl. 57—34 AT **23 Claims**

For SZ stranding, the stranding elements which remain united in the stranding or twisted unit are led in a stretched twisted condition to a twisting device which twists the twisted unit in sections, each of a multiple of stranding strokes. The twisting device is positioned closer to the takeup point than to the payout point of the twisted unit. A longitudinal section

of the twisted unit has a minimum length equal to the distance between the takeup point and the twisting device



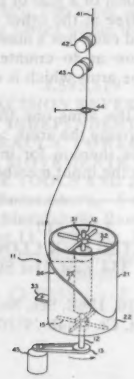
and a maximum length equal to three times the distance between the twisting device and the payout point.

3,593,510

YARN-TWISTING DEVICE

Peter A. Taylor, Greenville, S.C., assignor to Phillips Petroleum Company

Filed Sept. 2, 1969, Ser. No. 854,368
Int. Cl. D01h *1/06, 7/68, 7/70*
U.S. Cl. 57—74 10 Claims



A spindle adapted to receive a yarn package core is surrounded by an annular sleeve. The sleeve is split along a closed line located between and spaced form its ends to form an upper section and a lower section having mating surfaces. The median plane of the closed line is inclined at an acute angle to the spindle axis. The yarn to be twisted is passed from a point, exterior to the sleeve and at least substantially close to the spindle axis, through the space between the adjacent ends of the sleeve sections and onto the package core.

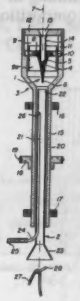
3,593,511

TWISTING HEAD FOR TEXTILE MACHINE

Claude Guignard, Ferney-Voltaire, France; Jean Pellaton, Chatelaine, and Maurice Poull, Meyrin, Switzerland, assignors to Electrospin Corporation, Columbus, Ohio

Filed Jan. 21, 1970, Ser. No. 4,669
Claims priority, application Switzerland, Feb. 18, 1969, 2418/69
Int. Cl. D01g *23/08;* D01h *7/92, 15/00*
U.S. Cl. 57—77.33 9 Claims

A supporting and driving head for a radially clamping grip having a venturi-type member in axial alignment for use in threading a yarn into the grip through its outlet end.

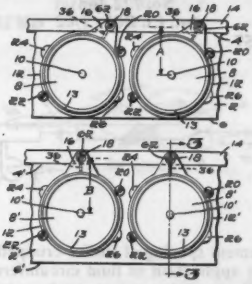


3,593,512

COMBINATION OF POROUS SPINNING OR TWISTING RINGS WITH A RING RAIL AND COMMON LUBRICANT SUPPLY

Andrew J. Wayson, Needham, and Richard N. Perkins, Rockland, both of, Mass., assignors to Merriman, Inc., Hingham, Mass.

Filed Aug. 13, 1969, Ser. No. 849,793
Int. Cl. D01h *7/62*
U.S. Cl. 57—120 6 Claims



A porous spinning ring and holder of a selected diameter is mounted on a ring rail of greater or lesser width and the holders and rings are connected with a common source of lubricant in the form of a pipe extending along the front or rear of the ring rail. The ring holder has a lateral extension of at least a minimum length and the holder may be rotated within limits on the ring rail to a position at which the effective connecting point of the extension will be directly over the lubricant pipe and the extension and pipe can be connected. The connection and the holder extension have passages in series leading from the pipe to the porous ring for the transmission of lubricant. Identical ring holders and rings mounted thereon may be used on ring rails of differing widths within limits and still be connected by identical means to a common source of lubricant.

3,593,513

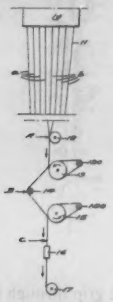
DYEING OF MIXED SYNTHETIC POLYMERIC YARNS

Cecil Everett Reese, Kinston, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 5, 1967, Ser. No. 665,623
Int. Cl. D02g *3/04*
U.S. Cl. 57—140 4 Claims

A composite yarn of two discrete classes of filaments, each class having a different dye affinity or dissimilar inherent apparent coloration is characterized by a degree of filament intermingling of at least 65 percent, a break elongation from 5 percent to 100 percent, the difference in percent break elon-

gation between the discrete classes of filaments being less than 15, and a tenacity from 1.0 to 10 g.p.d. The yarn is produced by separately spinning or cospinning two synthetic fiber-forming polymeric compositions into a multiplicity of

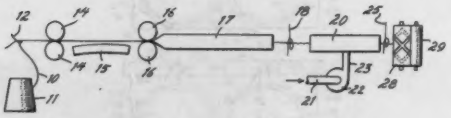


discrete filaments, combining the filaments into a composite yarn during or prior to drawing the filaments as an integral yarn, and further processing the yarn to yield the desired properties.

3,593,514
STRAND TREATMENT

Robert K. Stanley, Media, Pa., assignor to Techniservice Corporation, Kennett Square, Pa.

Continuation-in-part of application Ser. No. 620,873, Mar. 6, 1967, now abandoned. This application Oct. 22, 1968, Ser. No. 772,468
Int. Cl. D02g *1/02*
U.S. Cl. 57—157 **4 Claims**

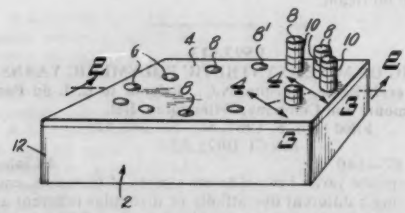


The interfilament spacing of stuffer-crimped textile strands is increased by application of fluid circumferentially thereto in a temporarily confining region, such as when the strand travels from the stuffer-crimping region to windup. The strand is false twisted in such processing, the initial direction of twisting being opposite to the direction of any substantial twist in the untreated strand.

3,593,515
PEG CLOCK

Janet R. Schockner, 818 N. Alta Vista Blvd., Hollywood, Calif., and Leo A. Rosetta, 9806 E. Bexhill Drive, Kensington, Md.

Filed Feb. 9, 1970, Ser. No. 9,476
Int. Cl. G04b *45/00*
U.S. Cl. 58—2 **13 Claims**

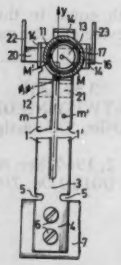


A hollow wood block houses a clock motor which drives a drum cam one turn in 12 hours. The drum cam sequentially lifts the pegs of a circular array of 12 pegs, representing the hours of the day, to project them upwardly from the upper surface of the block, each peg rising for 1 hour and being held in its upper position. When all 12 pegs have been lifted they are all dropped back into the block and the cycle is repeated.

3,593,516
MECHANICAL OSCILLATOR FOR TIME-KEEPING DEVICES

Franz R. Mayer, Altenfurt near Nuremberg, Germany, assignor to Diehl, Nuremberg, Germany

Filed June 23, 1969, Ser. No. 835,422
Claims priority, application Germany, June 21, 1968, May 3, 1969, P 17 73 678.0;P 19 22 640.5
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 **7 Claims**



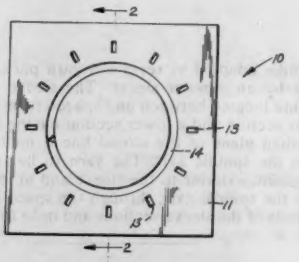
An oscillator in the form of a pair of parallel resilient arms joined at one end and free at the other end. The arms oscillate in counterphase and each has a mass element on the free end so disposed thereon as to counterbalance the torque about a line between the arms which is developed by oscillation of the arms.

At the free ends of the arms one thereof has associated therewith a driver for driving the arms, while the same, or the other arm, has a device thereon for imparting motion to a driven member, such as the input member for a clockwork.

3,593,517
ILLUMINATED DISK CLOCK FACE

Lawrence S. Knippler, 354 East 21st St. Apt. 3A, Brooklyn, N.Y.

Filed Sept. 10, 1968, Ser. No. 758,842
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 **1 Claim**

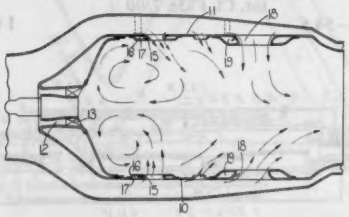


A clock face having a multiple of clear windows which will indicate through the use of an opaque disc having an arcuately clear window which will allow view to the face in order to indicate the hour. This device also includes an opaque disc to indicate minutes of the hour, the disc indicating minutes having a clear triangular window which will allow the passage of light from the interior of the clock to go through an annular window in order to indicate minutes of the hour simultaneously as the hour is indicated by the same light.

3,593,518
COMBUSTION CHAMBERS FOR GAS TURBINE ENGINES

Alan Joseph Gerrard, Blackburn, England, assignor to Joseph Lucas Industries Limited, Birmingham, England

Filed Sept. 17, 1969, Ser. No. 858,770
Claims priority, application Great Britain, Sept. 20, 1968, 44,805/68
Int. Cl. F02c 9/14
U.S. Cl. 60—39.65 7 Claims

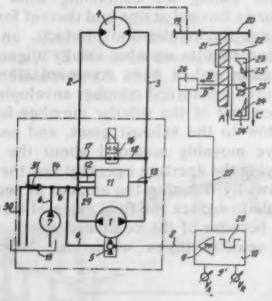


A combustion chamber for a gas turbine engine has a primary air inlet and a number of additional air nozzles at intervals along the chamber. Each of the air inlets has one or more holes in the inlet wall, so that air may be injected into the inlets or extracted therefrom. Air injection effectively reduces the inlet areas and extraction increases the inlet areas. The airflow through each inlet, or group of inlets, may thus be controlled, the arrangement being such that, irrespective of the proportion of the total airflow which enters each inlet, the resistance to airflow through the combustion chamber does not vary. The holes in the inlet walls may be tangential to create a vortex within the inlet.

3,593,519
DEVICE FOR PRECISION REVERSING IN A MANNER SUBSTANTIALLY INDEPENDENT OF LOAD, FOR USE IN A HYDRAULIC POWER DRIVE FOR RECIPROCATING MOVEMENTS, FOR INSTANCE FOR MACHINE TOOLS AND ELEVATORS

Paul Fuhrimann, Romanshorn, Switzerland, assignor to Hydrel A. G. Maschinenfabrik, Romanshorn, Switzerland

Filed June 11, 1969, Ser. No. 832,066
Claims priority, application Switzerland, Sept. 10, 1968, 13690/68
Int. Cl. F15b 15/18, 15/22
U.S. Cl. 60—52 R 11 Claims

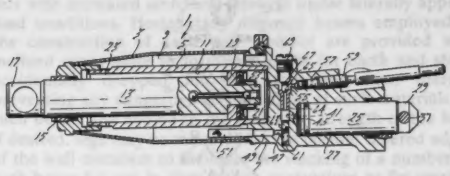


A system for the precision reversal of the motion of a movable member, such as an elevator, connected to a hydraulic motor. The movable member is provided with a pair of reversing surfaces so shaped as to determine braking distance, reversing point and reacceleration characteristics and cooperating with a feeler which transmits a signal through an amplifier to a servo valve for switching a pump.

3,593,520
SPEED PUMP FOR HYDRAULIC JACKS

James R. Laundy, Racine, Wis., assignor to Tenneco Inc., Houston, Tex.

Filed June 16, 1969, Ser. No. 833,585
Int. Cl. F15b 15/18
U.S. Cl. 60—52 HA 5 Claims



An unseated, pressure-responsive ball valve mechanism connects the speed pump of a two-speed hydraulic ram unit to the reservoir when the load on the ram reaches a level demanding the higher pressures produced by the power pump.

3,593,521
LOWERED HYDRAULIC CHAIR BASE

John M. Gardella, Matawan, N.J.; Anthony Ciavattoni, Staten Island, N.Y., and Karl Heimur, Staten Island, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 24, 1969, Ser. No. 879,279
Int. Cl. F15b 15/18
U.S. Cl. 60—52 HD 10 Claims

A hydraulic chair base, for raising and lowering a dental chair, has a unitary pump-closed reservoir structure mounted thereon for delivering fluid to a fluid motor to raise the chair. Return of the fluid to the reservoir is controlled by a valve. Additionally, a catch sump is provided to capture fluid leakage from the fluid motor, from which catch sump the pump returns the fluid leakage to the reservoir, the catch sump also serving to capture any fluid in excess of the capacity of the closed reservoir.

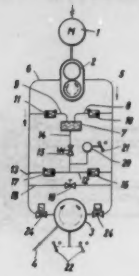
3,593,522
ELECTROHYDRAULIC SERVO DEVICE

Hans Angert, Mannheim-Feudenheim, and Oskar Imb, Mannheim, both of, Germany, assignors to Brown, Boveri & Cie A. G., Mannheim, Germany

Filed May 14, 1969, Ser. No. 824,494
Claims priority, application Germany, May 21, 1968, Mar. 29, 1969, P 17 50 645.5;P 19 16 266.4
Int. Cl. F16d 31/04; F15b 15/26
U.S. Cl. 60—53 17 Claims

Electrohydraulic servo devices are described comprising an electric drive motor, a fluid medium pump connected to and driven by the drive motor, a tank containing hydraulic fluid as the pumping medium, a hydraulic servomotor communicating with and acted upon by the pump medium and means for reversing or operating in either of opposite directions of rotation the electric drive motor, the pump and the servomotor. Incoming and outgoing pressure medium lines are provided which are connected to the servomotor

and form a closed circuit, each of the said pressure medium lines communicating with the tank containing the fluid medium and having a check valve therein to direct flow of medium from tank to pump.

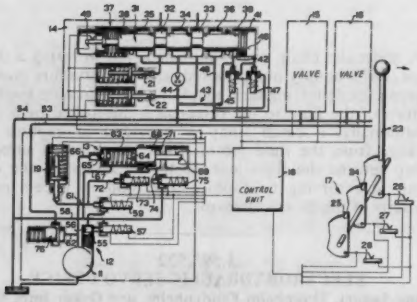


3,593,523

ELECTROHYDRAULIC REMOTE CONTROL OF HYDRAULIC DIRECTIONAL VALVES

Heniz Flaschar, Ludwigsburg; Walter Werner, Waiblingen; Wilhelm Weigert, Schwieberdingen, and Manfred Kramer, Feilbach-Lindle, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 30, 1969, Ser. No. 872,672
Claims priority, application Germany, Nov. 6, 1968, P 18 07 172.2
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 VS **11 Claims**



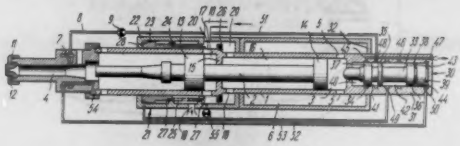
An arrangement for the electrohydraulic remote control of directional valve in which a variable displacement pump provides fluid under pressure to a load or a hydraulically operated device. Signal transducers are arranged at the pump and the load to provide electrical signals as a function of the pressures prevailing at the pump and the load. An electrical control unit compares the signals from the transducers, and is operatively connected to an electrohydraulic actuated positioning means in the pump when the signals correspond. The regulation is such that the fluid flow from the pump is controlled as a function of the load magnitude.

3,593,524

DEVICE FOR PRODUCING HIGH-PRESSURE PULSE-TYPE JETS OF LIQUID

German Petrovich Chermensky, ulitsa Novskogo, II, kv. 3; Mikhail Andreevich Nikiforov, ulitsa Kirova, 33, kv. 19; Jury Vladimirovich Gaiduk, ulitsa Shkolnaya, 21, kv. 13; Klavdia Mikhailovna Khvoschevskaya, ulitsa Kirova, 7, kv. 39; Igor Borisovich Natapov, Rynochny proezd, 3, kv. 11; Alexei Andreevich Kilin, ulitsa Kutuzova, 58, kv. 2, and Mikhail Antonovich Shvetsov, ulitsa Ryazanskaya, 9, all of Novokuznetsk, U.S.S.R.

Filed Dec. 23, 1969, Ser. No. 887,645
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.5 **1 Claim**



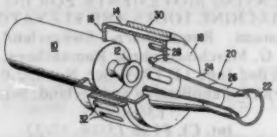
The invention describes a device for producing pulse-type high-pressure liquid jets created by the impact of a piston on the liquid contained in a chamber having a hole for the outflow of the liquid. For this purpose the piston is accelerated in the cylinder by compressed gas and, after producing an impact returns to the initial position compressing the gas by feeding the liquid under pressure into said cylinder.

3,593,525

ROCKET MOTOR THRUST CONTROLLER

Allen B. Holmes, Rockville, Md., assignor to the United States of America as represented by the Secretary of the Army

Filed Feb. 19, 1969, Ser. No. 800,652
Int. Cl. F02k *9/04*
U.S. Cl. 60—254 **4 Claims**



A rocket motor thrust controller having a hollow cylindrical rocket motor casing for containing solid propellant therein with a nozzle formed at one end thereof for providing an exhaust passage for combustion products, an elongated open ended hollow tubular member axially aligned with the rocket motor casing and in open communication with the nozzle, an apertured cylindrical member enveloping the nozzle and one open end of the tubular member for inducing secondary air flow to the exhaust gases, and an apertured cylindrical sleeve movably mounted about the cylindrical member for varying the aperture openings and the amount of secondary airflow. By reducing the amount of secondary air flow, it is possible to reduce the final value of thrust by over a factor of two because of the combined effect of the mass reduction and velocity losses within the hollow tubular member.

3,593,526

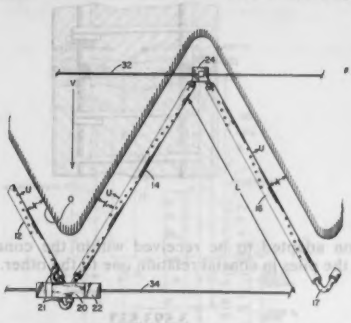
APPARATUS AND METHODS FOR OIL SLICK CONTAINMENT

David Parks Hoult, 11 Cameron Road, Wayland, Mass., and James Alan Fay, 36 Spruce Hill Road, Weston, Mass.

Filed June 4, 1969, Ser. No. 830,270
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 **2 Claims**

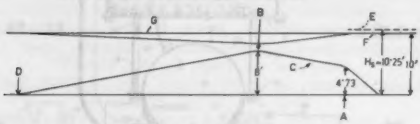
Apparatus and methods for oil slick containment in the open sea, in the presence of waves and currents, utilizing a

submerged, segmented, pneumatic boom arranged in zigzag, accordion-pleated configuration in which the included angle between adjoining segments is between about 120° and 20°, with the minimum distance between adjacent apices greater



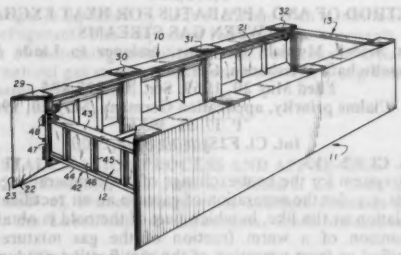
than wave-caused water movement, the boom segments being submerged beneath the water surface at the predetermined depth *d* in which *d/a* is in the range of 5 to 10, *a* being the value of wave amplitude.

3,593,527
WATER FLOW CONTROL
Gordon Rieneke McKay, Brookfield, Queensland, Australia, assignor to The University of Queensland, Queensland, Australia
Filed Apr. 21, 1969, Ser. No. 817,935
Int. Cl. E02b *3/00, 9/02*
U.S. Cl. 61—2 **3 Claims**



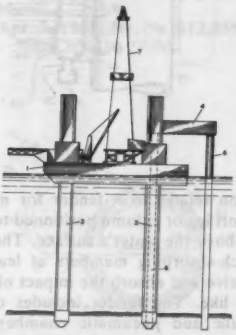
A structure for control of liquid flow, (such as a dam or weir, or a channel or culvert) has the relations between depth, width and total flow at every cross section perpendicular to the flow, such as to give minimum energy of flow at a maximum design level.

3,593,528
SAFETY TRENCHING BOX
John R. Pavese, 771 Rivervale Road, Rivervale, N.J.
Filed Dec. 15, 1969, Ser. No. 885,252
Int. Cl. E21d *7/00*
U.S. Cl. 61—41 **2 Claims**



A safety trenching box is provided having a pair of earth-retaining wall members which are tapered at one end thereof to form a pair of vertical cutting edges. The vertical cutting edges permit the box to be dragged through trench excavations having little or no clearance between the sides of the box and the sides of the trench, since the edges shear off projecting portions of the trench walls. The bottom edge of each wall member is also tapered to form a pair of horizontal cutting edges on the box and push plates are provided on the top edge of each wall member to permit the trenching box to be driven downwardly into the trench by externally applied forces. The outer surface of each of the wall members in contact with the sides of the trench is cambered to provide the box with increased structural strength under laterally applied load conditions. Horizontally disposed beams employed in the construction of each wall member are provided with inclined cover plate to form skid paths for earth and stone accidentally dropped into the trenching box, thereby preventing any dangerous accumulation of such materials on such beams and adding to the structural strength of the box. If desired, legs may be mounted on the bottom tapered edges of the wall members to facilitate the stacking of a number of such boxes for use in deep trench excavations or for storage purposes.

3,593,529
METHOD AND APPARATUS FOR INSTALLING DRILLING PLATFORMS
August Hendrik Maria Smulders, Wassenaar, Netherlands, assignor to N. V. Industrieele, Handelscombinatie, Netherlands
Filed Oct. 9, 1968, Ser. No. 766,274
Claims priority, application Netherlands, Oct. 11, 1967, 67-13804
Int. Cl. E02b *17/02*; **B63b** *35/44*
U.S. Cl. 61—46.5 **1 Claim**

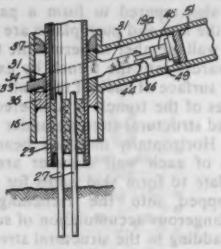


A buoyant mobile drilling platform has a gap in its side in which is detachably disposed a permanent drilling platform. The two platforms are floated to the drilling site and temporarily emplaced. If a test drill shows the presence of gas or oil, then the permanent platform is permanently emplaced and the mobile platform is floated away.

3,593,530
MARINE PLATFORM WITH REMOVAL COLUMN CLAMPS
Ivo C. Pogonowski, Houston, Tex., assignor to Texaco Inc., New York, N.Y.
Filed July 22, 1969, Ser. No. 843,331
Int. Cl. E02b *17/06*
U.S. Cl. 61—46.5 **9 Claims**

The invention relates to a marine platform adapted to be fixedly positioned in an offshore environment by anchoring to the ocean floor. The platform includes a work deck normally elevated above the water's surface, a foundation pedestal at the ocean floor, and one or more intermediary support columns which connect the deck to the pedestal. The

columns are releasably held at their lower ends by remotely actuated clamping means. The elevated deck is thus supportably carried by the columns at an adjustable operating height.

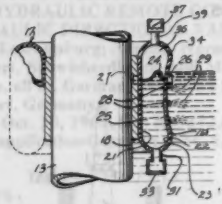


3,593,531

MARINE FENDER

Fuad T. Saadeh, and Ivo C. Pogonowski, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 27, 1969, Ser. No. 837,074
Int. Cl. E02b 3/22
U.S. Cl. 61—48 6 Claims



The invention relates to a fender for marine structures such as a support leg or column positioned to elevate a working platform above the water's surface. The fender is comprised of shock-absorbing members at least partially submerged to receive and absorb the impact of floating vessels, debris or the like. The fender includes cooperatively arranged hydraulic and pneumatic chambers, the hydraulic chamber being communicated with the body of water whereby to be maintained in a substantially full condition. The pneumatic chamber is separated from the hydraulic chamber by a yieldable diaphragm which is displaced into the air chamber as the fender is deformed in response to contact with a large floating body.

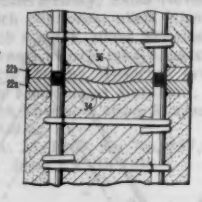
3,593,532

CONCRETE PILE SECTIONS AND JOINTS THEREFOR

John Grazel, Santurce, P.R., assignor to John Grazel Inc., San Juan, P.R.

Filed Oct. 2, 1968, Ser. No. 764,384
Int. Cl. E02d 5/30
U.S. Cl. 61—56 3 Claims

Each cast concrete pile section has longitudinally extending reinforcing rods, the opposite ends of which are partially received within openings formed through normally disposed end plates. The rod ends extend intermediate the length of the openings and are welded to the end plates about the inside faces of the plates with weld also being applied externally within the openings from the outer faces of the plates. The edges of the end plates are beveled and the sectional piles are welded about the adjoining beveled edges in end to end relation. In one form, an end plate on one pile section is formed with a central concavity while the end plate on the adjoining pile section has a complementary central convex portion adapted to be received within the concavity as to align the piles in coaxial relation one to the other.

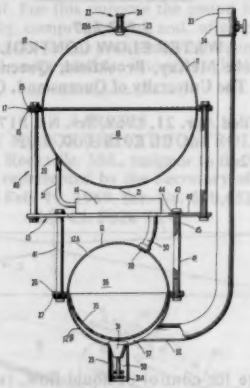


3,593,533

UNDERWATER COLLECTING AND LIFTING DEVICE

Lamar Washington, Natick, Mass., assignor to Ocean Recovery Corporation of America, Cambridge, Mass.

Filed Oct. 23, 1968, Ser. No. 769,843
Int. Cl. B63c 11/00; G01n 1/14; E02f 3/88
U.S. Cl. 61—69 7 Claims



An underwater collecting and lifting device for use in obtaining material from below the earth's surface, such as the floor of the ocean, has a first chamber for raising and lowering the device in a body of water and a second chamber for collecting the material and transporting it. A diaphragm divides the second chamber into two compartments and is movable so as to change the volumes of the two compartments inversely to each other.

3,593,534

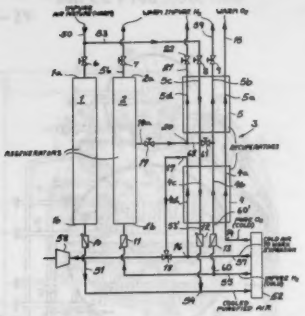
METHOD OF AND APPARATUS FOR HEAT EXCHANGE BETWEEN GAS STREAMS

Max Seidel, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed May 20, 1969, Ser. No. 827,485
Claims priority, application Germany, May 20, 1968, P 17 51 383.6
Int. Cl. F25j 1/00, 3/04, 5/00
U.S. Cl. 62—13 11 Claims

A system for the heat exchange of low-temperatue gas mixtures, e.g. for the separation of gases in an air rectification installation or the like, in which part of the cold is obtained by expansion of a warm fraction of the gas mixture to be rectified or from a portion of the rectification products. The heat exchanger system is subdivided into regenerators and recuperators which are interchangeable in function at least in part. The recuperator system is subdivided into a relatively cold recuperator branch and a relatively warm recuperator branch. A portion of the gas mixture to be expanded or the

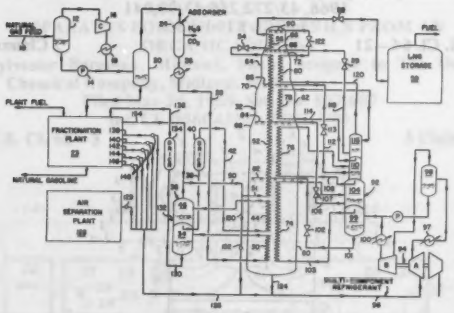
aforementioned fraction of the rectification product is warmed in an unswitched passage of the colder recuperator branch while another fraction of the gas mixture or rectification products is withdrawn form an intermediate location of the regenerator and is passed through the warmed recuperator branch.



3,593,535
LIQUEFACTION OF NATURAL GAS EMPLOYING MULTIPLE-COMPONENT REFRIGERANTS

Lee S. Gaumer, Jr., Allentown, and Charles L. Newton, Emmaus, both of, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of application Ser. No. 722,135, Apr. 17, 1968, now abandoned , which is a continuation of application Ser. No. 468,008, June 29, 1965, now abandoned. This application Dec. 22, 1969, Ser. No. 882,781
Int. Cl. F25j *3/00*
U.S. Cl. 62—23 **5 Claims**



Natural gas is liquefied by heat exchange with a multicomponent refrigerant. The respective refrigerant components in the order of increasing volatility are heat exchanged serially with the natural gas stream at progressive points along zones of decreasing temperature.

3,593,536
CRYSTALLIZATION PROCESS AND APPARATUS

Regis Lafay, Suresnes, and Jean C. Macaire, La Celle St. Cloud, both of, France, assignors to Institute Francais du Petrole, des Lubrifiants et Carburants, Rueil-Malmaison, France

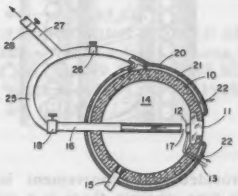
Filed July 8, 1968, Ser. No. 743,114
Claims priority, application France, July 11, 1967, 113992
Int. Cl. B01d *3/30, 9/04*
U.S. Cl. 62—58 **19 Claims**

A process for selectively crystallizing one of the constituents of a liquid mixture of at least two components comprising cooling down the mixture by direct thermal exchange with an immiscible liquid coolant circulating in a countercurrent relationship with respect to said mixture and introduced at a sufficiently low temperature to permit the crystallization of one of said components, wherein said direct thermal exchange is effected by passing the liquid mixture and the immiscible liquid coolant alternately through a plurality of stirring zones and quiet zones, the formation of the crystals of the crystallizable component taking place in the stirring zones and the partial separation of the crystals taking place in the quiet zones.

3,593,537
PROCESS AND APPARATUS FOR RAPIDLY COOLING A SMALL THERMAL LOAD

Robert W. Stuart, Wakefield, and Walter H. Hogan, Wayland, both of, Mass., assignors to Cryogenic Technology, Inc., Waltham, Mass.

Filed Apr. 7, 1969, Ser. No. 813,959
Int. Cl. F25b *19/00*
U.S. Cl. 62—62 **12 Claims**



A small thermal load such as an infrared detector is exposed to a high-pressure inert fluid contained within a small high-pressure vessel. A valve-controlled vent tube extending through the wall of the vessel provides means for controllably bleeding off fluid from the vessel and hence for rapidly developing refrigeration. The fluid bled off may be circulated around the vessel surface to minimize loss of refrigeration in cooling the vessel wall.

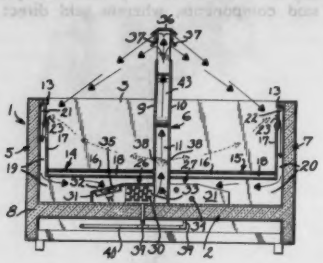
3,593,538
REFRIGERATOR FLORAL DISPLAY CABINET

Ralph W. Bachman, and Alvin Miller, both of Minneapolis, Minn., assignors to Bachman's Inc., South Minneapolis, Minn.

Filed Apr. 7, 1969, Ser. No. 814,071
Int. Cl. A47f *3/04*
U.S. Cl. 62—256 **2 Claims**

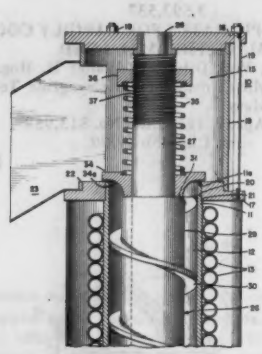
An elongated refrigerator floral display cabinet having an open top and a merchandise-supporting tray therein cooperating with the cabinet to define a plenum having an air inlet adjacent the top of one longitudinal wall. Refrigerating mechanism includes a plurality of longitudinally spaced evaporator units in the plenum, the evaporator units having air inlets connecting with the plenum and air outlets communicating with air passage means in an opposite longitudinal

cabinet wall. Blower means imparts airflow through the evaporator units upwardly through said air passage means,



and deflector means overlying the air passage means directs flow of air therefrom angularly downwardly over the tray and toward the air inlet to the plenum.

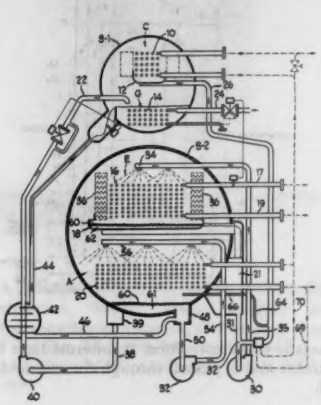
3,593,539
ICE-FLAKE-MAKING MACHINE
Armin Fiedler, 1109 West North Shore Ave., Chicago, Ill.
Filed Nov. 14, 1968, Ser. No. 775,876
Int. Cl. F25c *1/14*
U.S. Cl. 62—354 **7 Claims**



There is provided an improvement in an icemaking machine of the type wherein there is a cylindrical vertical chamber including a chamber sidewall having a discharge opening at its upper end. Means are provided for supplying water to the lower end of the chamber. Refrigeration means are provided for freezing the water on the inside surface of the chamber wall. A screw conveyor is rotatably mounted within the chamber and includes a helical screw in close proximity to the inside surface of the chamber to scrape off ice therefrom as the conveyor rotates and delivers a column of ice toward the opening. A generally annular breaker member is provided around the upper portion of the screw conveyor in the path of the column of ice moving toward the opening. Means are provided for biasing the breaker member downwardly.

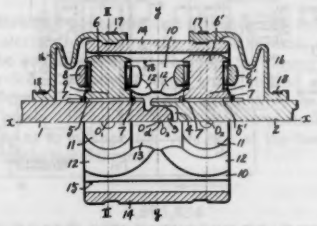
3,593,540
ABSORPTION REFRIGERATION SYSTEM USING A HEAT TRANSFER ADDITIVE
Neil E. Hopkins, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jan. 2, 1970, Ser. No. 60
Int. Cl. F25b *15/06*
U.S. Cl. 62—476 **3 Claims**

An apparatus and method for increasing the effectiveness of a heat transfer additive, such as, for example, 2-ethyl, *n*-hexanol, in an absorption refrigeration machine by introducing the refrigerant containing the additive directly from the condenser into a circulating stream of refrigerant being withdrawn from the evaporator, and being pumped to the evaporator refrigerant distribution system, thus distributing the additive flow from the condenser uniformly throughout



the evaporator surface. Any noncondensables from the condenser are vented back to the absorber, where they are removed by a conventional purge device. Increased capacity can also be achieved by cooling the refrigerant with condensing water.

3,593,541
CONSTANT VELOCITY UNIVERSAL JOINT
Masao Kuroda, Mie-ken, Japan, assignor to Toyo Bearing Manufacturing Company Limited, Osaka-shi, Japan
Filed Apr. 10, 1969, Ser. No. 815,059
Claims priority, application Japan, Apr. 23, 1968, Dec. 9, 1968, 43/272,256;43/90,041
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 **7 Claims**



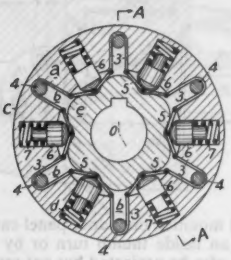
An improved essentially constant speed universal joint comprises two shafts with interfitted ends, each carrying a frustospherical boss provided with stud shafts. The spherical portions of the bosses are mounted in spherically surfaced recesses in adjacent wall elements. The stud shafts are provided with wheels, preferably crowned, which roll on tracks carried by the wall elements, preferably grooves concentric with the spherical recesses therein, in which the crowned wheels are centered. The shaft ends are interfitted by male and female elements fixed to the respective shafts, which provide a simple, strong and lubrication-promoting structure. Securing means, confined to a region radially outwardly of the tracks, wheels an stud shafts, and preferably in the form of a sleeve, or of elements integral with the wall elements, secures the assembly in a simple, permanently effective manner.

3,593,542

LIMITED TORQUE COUPLING

Motoro Urayama, 9-8 Icibancho Koshien, Nishinomiya Hyogo, Japan

Filed June 4, 1969, Ser. No. 830,930
Int. Cl. F16d 3/56, 7/00
U.S. Cl. 64—29 6 Claims



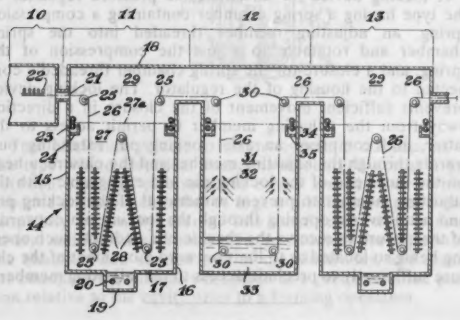
A torque coupling having its capacity limited by the torque and the speed includes a hollow cylinder having plate links which form an apex which may extend toward the rotary coupling part or outwardly therefrom, the rotary coupling part having concave and convex surfaces for receiving the apex of the plate links with the plate links being supported by U-shpad springs and the apex formed by the plate links being urged inwardly by a spring reacting against a weight engaging the apex of the plate links so that spring pressure normally produces the driving action between the hollow cylinder and the rotary coupling part while the weights are urged outwardly by centrifugal force to limit the speed at which the coupling maintains a driving relation. The concave-convex surfaces may be rounded about centers transverse to the input and output axes to permit angular relation without stress.

3,593,543

APPARATUS FOR TREATING FABRICS FROM AN ORGANIC SOLVENT

Sylvester Bergman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 26, 1969, Ser. No. 827,607
Int. Cl. D06f 43/06; D06c 1/06
U.S. Cl. 68—5 3 Claims



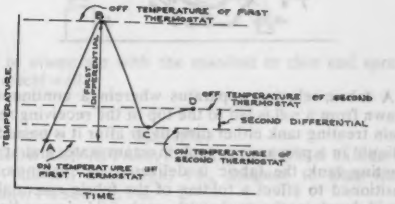
The present invention relates to an apparatus for treating fabrics from an organic solvent, e.g. dyeing, which apparatus comprises: a formulation application module having means associated therewith to apply an agent to a fabric, a first chamber, in fluid communication with the formulation application module and having means to maintain a zone within the chamber filled with vapors of an organic solvent, means to remove solvent vapors, and means, which may be the solvent vapors, to exchange heat into the fabric, a second chamber having means to flush and wash the fabric, and a third chamber which is substantially identical with the first said chamber.

3,593,544

AUTOMATIC CLOTHES DRYER TO HEAT SHRINK TRANSFER AGENT USED TO CLEAN FABRICS

Billie D. Henderson, Louisville, Ky., assignor to General Electric Company

Filed Nov. 24, 1969, Ser. No. 879,034
Int. Cl. D06f 33/02; F26d 21/02, 21/06
U.S. Cl. 68—12 2 Claims



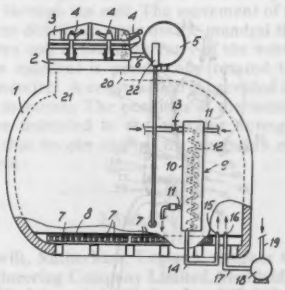
An automatic clothes dryer adapted to clean fabrics by tumbling the fabrics therein with a charge of liquid and transfer agent, and then to automatically separate the transfer agent from the fabrics, is provided with a control means to bring the temperature of the air flowing through the dryer drum to a temperature sufficient to heat shrink the soiled, segregated transfer agent, thereby reducing its volume and facilitating its disposal.

3,593,545

APPARATUS FOR DYEING TEXTILE ARTICLES

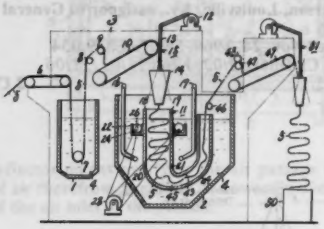
Manfred Blumenkamp, Via Bissolati, Cremona, Italy

Filed Jan. 3, 1969, Ser. No. 788,883
Claims priority, application Italy, July 8, 1968, 18699A/68
Int. Cl. D06f 17/02, 39/04
U.S. Cl. 68—15 2 Claims



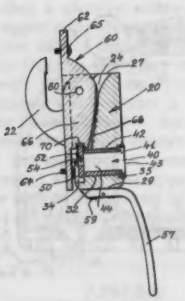
An apparatus for dyeing textile articles including a tank for the dye bath and heating means, said tank comprising a top opening for the introduction withdrawal of the articles to be processed, an outer cover for sealingly close said opening, at least one nozzle for compressed air supplied by a suitable source, and at least one nozzle for a dyeing liquid which is drawn from said dye bath, the said nozzles being arranged in said tank in such manner as to cause circulation stream in said dye bath throughout the said tank.

3,593,546
FABRIC-RELAXING APPARATUS
Fumisato Hasegawa, Kashiwara-shi, and Hiroyuki Nagata, Hiroshima-shi, both of, Japan, assignors to Hirano Kinzoku Kabushiki Kaisha, Osaka-shi, Japan
Filed Dec. 2, 1968, Ser. No. 780,420
Claims priority, application Japan, Dec. 16, 1967, 42/105845
Int. Cl. B05c *3/05, 3/134*
U.S. Cl. 68—178 5 Claims



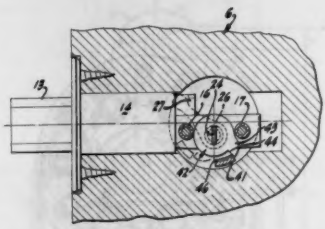
A fabric-relaxing apparatus wherein a continuous fabric drawn from a roll is led to the top of the receiving region of a main treating tank either directly or after it is passed through a liquid in a preparatory tank in a taut state, and at the main treating tank the fabric is delivered by shaking-off means positioned to effect a folding of the fabric essentially at the liquid level in the tank with each fold descending in the liquid in spaced relation to the next formed fold. The region, or vertical passage, through which the fabric descends is positioned within a vertical passage frame comprising two plates which are vibrated essentially out of contact with the fabric, and their vibration effects agitation or pulsation of the liquid, which in turn imparts beat shocks, i.e. pulsations, to the fabric. The fabric is then led out of the bottom of the vertical passage frame to one side of the main treating tank through a guide installed in the liquid and being then led out of the main treating tank through the opening in said guide, said fabric being then stacked as folded at a predetermined place outside the main treating tank.

3,593,547
TAMPER-RESISTANT LOCKING LATCH FOR CASEMENT WINDOWS
Harold V. Taylor, 40 Parkway Circle, Scarsdale, N.Y.
Filed Aug. 18, 1969, Ser. No. 850,951
Int. Cl. E05b *7/00, 13/10;* E05c *3/04*
U.S. Cl. 70—89 7 Claims



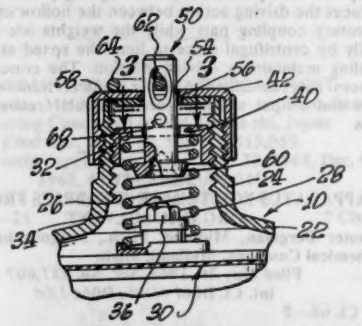
A locking latch assembly for a casement window has a handle block pivotally engaged on a base bracket which mounts on the jamb of the window. A cylinder lock is set in the block and can only be opened by a key. The bracket has slotted sidewalls which engage a cam at the inner end of the rotatable lock cylinder in the block. The cam and lock are enclosed and protected against tampering. The assembly has a replaceable handle.

3,593,548
EXTERIORLY OPERABLE LOCK BOLT
Marron Kendrick, Atherton, Calif., assignor to Schlage Lock Company
Filed May 5, 1969, Ser. No. 821,673
Int. Cl. E05b *63/00, 33/00;* E05c *1/06*
U.S. Cl. 70—129 7 Claims



A lock bolt mounted on a door panel can be projected and retracted by an inside thumb turn or by an outside key or both and can also be projected but not retracted by a finger-operated, outside movable piece.

3,593,549
PRESSURE REGULATOR WITH LOCKING DEVICE
Frederick R. Lakins, Alhambra, and Scott E. Allen, Los Angeles, both of, Calif., assignors to Swingspout Measure Co., Los Angeles, Calif.
Filed Dec. 10, 1969, Ser. No. 883,880
Int. Cl. F16k *35/10, 17/06*
U.S. Cl. 70—164 4 Claims

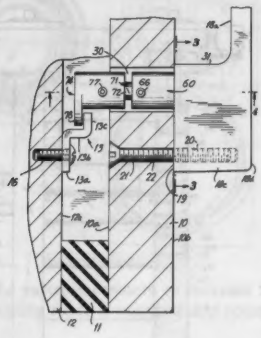


A locking device for an adjustable pressure regulator of the type having a spring chamber containing a compression spring, an adjusting member threaded into the spring chamber and rotatable to adjust the compression of the spring, and a closure for the spring chamber threadedly connected to the housing of the regulator. The locking device prevents sufficient movement of the closure in a direction away from the adjusting member to permit access to the latter, and comprises an axial locking pin extending outwardly through the adjusting member and the closure, a head on the inner end of the locking pin and engageable with the adjusting member to prevent withdrawal of the locking pin, and a transverse opening through the locking pin outwardly of the closure to receive the shackle of a padlock, such opening being so located as to limit outward movement of the closure sufficiently to preclude access to the adjusting member.

3,593,550
REFRIGERATOR DOOR HANDLE WITH CYLINDER DOOR LOCK UNIT ON THE HANDLE
Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Hardware Corporation, Binghamton, N.Y.
Filed Oct. 22, 1968, Ser. No. 769,677
Int. Cl. G05g *5/26;* E05b *27/08, 65/06*
U.S. Cl. 70—207 9 Claims

The cylinder lock unit is mounted on the handle. It has adjustment features for rough as well as fine adjustment. A stud

of appropriate length is used to take care of the thickness of the door. A setscrew on a locking cam takes care of micrometer adjustment for variations in door and gasket



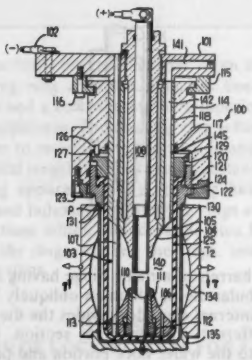
thickness. This handle and lock unit is for magnetic closure gasket-type refrigerator doors. The handle is fixed to the door by screws.

3,593,551

ELECTROHYDRAULIC TRANSDUCERS

Roth, Donald J., Chicago Heights, and Pesce, Carl A., Chicago, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Sept. 25, 1968, Ser. No. 762,523
Int. Cl. B21d *26/12*
U.S. Cl. 72—56 **7 Claims**



This disclosure relates to electrohydraulic transducers of the type where electrical energy is discharged across a gap between a pair of electrodes to create a shock wave which expands a flexible chamber to urge a tubular workpiece telescopically externally thereof into conformity with a mold cavity, and includes an internal cage structure for supporting the chamber and at least one of the electrodes, and means for clamping the tubular workpiece at a predetermined position relative to the cavity prior to a forming operation.

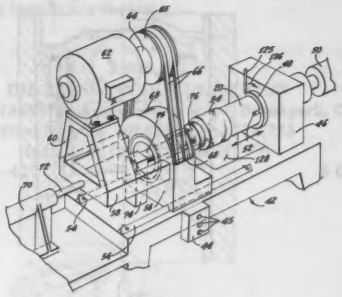
3,593,552

CAN BODY FABRICATION

Ermal C. Fraze, Dayton, Ohio, assignor to Dayton Reliable Tool & Mfg. Company, Dayton, Ohio

Filed Mar. 12, 1969, Ser. No. 806,550
Int. Cl. B21d *22/16*
U.S. Cl. 72—83 **23 Claims**

To produce a cylindrical can body, a cup-shaped workpiece having a relatively thick and relatively short cylindrical wall is telescoped over the end of a mandrel and a rotating ring of hard material is advanced axially onto and along the



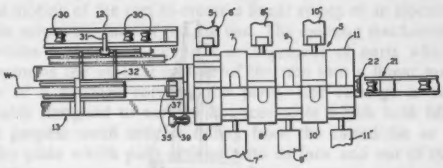
mandrel to cooperate with the mandrel to thin and spread the cylindrical wall.

3,593,553

METHOD AND APPARATUS FOR ROLLING TUBES

Rodder, William, Pittsburgh, Pa., assignor to Blaw-Knox Company, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 432,597, Feb. 15, 1965, now Patent No. 3,392,565. This application July 12, 1968, Ser. No. 744,366
Int. Cl. B21b *17/10*
U.S. Cl. 72—209 **14 Claims**



A tube mill and a method of rolling tubes in which tubular workpieces are supported by a mandrel as they pass through a series of roll stands that have grooved rolls that reduce the wall thickness and greatly elongate the workpieces during their passage through the mill. The movement of the mandrel is controlled to distribute wear on the mandrel throughout a substantial area and to facilitate entry of the workpieces into the mill. The mandrel is periodically rotated to distribute wear on the mandrel. A construction is provided for quick interchange of mandrels. The positions of the mandrel and the workpiece are indicated to the operator during the rolling operation so that he can change the operation of the mill if that is desirable.

3,593,554

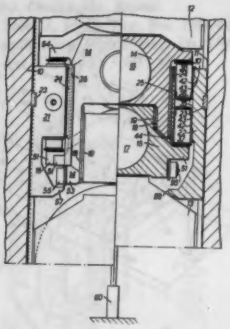
ROLLING MILLS

Eric Owen Swift, Rotherham, England, assignor to Davy and United Engineering Company Limited, Sheffield, England

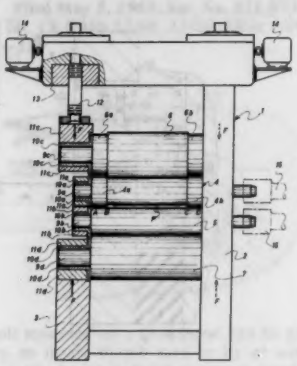
Filed Aug. 4, 1969, Ser. No. 847,322
Claims priority, application Great Britain, Aug. 9, 1968, 38054/68
Int. Cl. B21b *31/10*
U.S. Cl. 72—238 **12 Claims**

In a rolling mill the bearing chock assemblies of the processing rolls are arranged with the chocks on one roll in the chocks of the other roll and the chock assemblies are provided with wheels, rollers or slide surfaces which are brought into engagement with beams in the mill housings for the purpose of roll changing. The novelty resides particularly in that the wheels on adjacent chocks engage the same beams

with the wheels on one chock behind the wheels on the other chock and in this way the processing rolls and their chocks can be withdrawn together from the mill housings at fixed centers and with the rolls spaced apart.



bearing surfaces along their entire length whereby the bearing surfaces of the working rolls are held in pressure engagement with each other while a rolling space is defined therebetween to permit the product to pass therethrough.

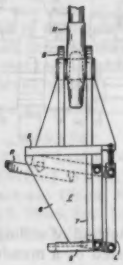


3,593,555

HANDLING APPARATUS FOR MILL ROLLS

John A. Grosko, Whitaker, Pa., assignor to United States Steel Corporation

Filed July 22, 1968, Ser. No. 746,659
Int. Cl. B21b *31/10*
U.S. Cl. 72—239 **7 Claims**



A roll-handling device for suspension from and operation by the hook of a crane hoist comprising a frame having a pair of horizontal arcuately shaped plates for supporting engagement with a circumferentially extending rib on an assembly of a bearing chock and a mill roll. Lateral movement of the assembly out of engagement with the supporting plates is prevented by a holding member in the form of a ring which is mounted on the frame for movement to an operative holding position in which it encircles the roll neck and is moved to such position by a linkage system that is operated in response to upward movement of the frame to engage said plates with said supporting rib.

3,593,556

ROLLING MILL WITH PRESTRESSED HOUSING

Paul Blain, Saint Germain-en-Laye, Yvelines, France, assignor to Institut de Recherches de la Siderurgie Francaise, St. Germain-en-Laye, France

Filed Apr. 14, 1969, Ser. No. 815,810
Claims priority, application France, Apr. 12, 1968, 148,137
Int. Cl. B21b *13/14*
U.S. Cl. 72—241 **5 Claims**

In a four-high mill, the two working rolls have bearing surfaces in rolling contact with each other. Pressure is exerted upon the two mating backup rolls and transmitted to the

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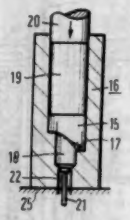
3,593,557

METHOD AND APPARATUS FOR MAKING A RISING HINGE

Anton Uekotter, and Paul Greisner, both of Telgte, Westphalia, Germany, assignors to Aug Winkhaus, Telgte, Westphalia, Germany

Filed Feb. 5, 1969, Ser. No. 796,768
Claims priority, application Great Britain, Mar. 13, 1968, 12192/68
Int. Cl. B21c *23/00*
U.S. Cl. 72—254 **6 Claims**



The tubular barrels of a rising hinge having a loose pin are shaped in a tubular die in which an obliquely inclined annular face of an internal shoulder divides the die bore into two portions of different uniform cross section, by inserting a metal blank into the wider bore portion and partly extruding the metal through the orifice in the annular face into the second, narrower bore portion. The wider portion of the intermediate metal body so obtained which duplicates the shape of the annular face, is drilled out to a cross section greater than that of the narrower bore portion so that the narrower metal portion is severed from the now-tubular wider portion of the metallic body.

3,593,558

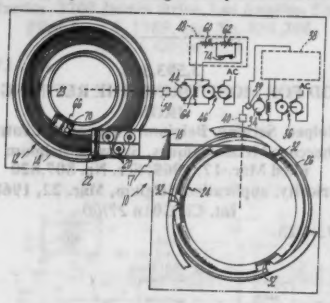
PAYOFF REEL CONTROLLER

Alexander F. Sperduti, New Britain, Conn., assignor to The Fenn Manufacturing Company, Newington, Conn.

Filed July 24, 1969, Ser. No. 844,389
Int. Cl. B21c *1/02*
U.S. Cl. 72—289 **9 Claims**

A drawing block having a die box, a rotatable block for drawing stock through the die box, and a motorized payoff reel for feeding stock in a generally arcuate path to the die box and having a sensing rotor mounted for sensing inward movement of the arcuate stock feed path. A pair of variable resistors are connected in series with the field of the payoff

reel drive motor and a switch operated by a speed-sensitive actuator rotated by the sensing rotor provides for selectively



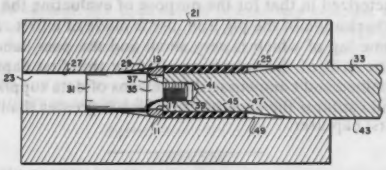
shunting one of the variable resistors to increase the motor speed when the sensing rotor is engaged and rotated by the stock.

3,593,559

APPARATUS FOR TUBE TAPERING AND REFORMING A DRAWING RING

John W. Hinshaw, Garden Grove, Calif., assignor to The Battelle Development Corporation, Columbus, Ohio

Filed Mar. 10, 1969, Ser. No. 805,581
Int. Cl. B21d *22/10*
U.S. Cl. 72—354 **2 Claims**



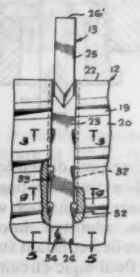
Apparatus for reducing the diameter of an expanded tube-tapering drawing ring after the ring has been enlarged by tapering a tube and a combination tube-tapering and drawing ring reducing apparatus. The drawing ring is forced through a tapered cylinder to reduce both the outside and inside diameter while the axial length is maintained substantially constant. A tube-drawing apparatus has a rotating head for holding drawing rings and indexing the drawing rings at a plurality of operational stations which include apparatus for tube drawing, annealing the rings, cooling the rings, and reducing the diameter of the rings.

3,593,560

FORMATION OF LOCKING KEYS FOR FASTENERS

Robert Neuschotz, 1162 Angelo Drive, Beverly Hills, Calif.

Division of Ser. No. 798,659, Feb. 12, 1969.
Filed Mar. 17, 1970, Ser. No. 20,293
Int. Cl. B21k *1/76*; B21d *53/24*
U.S. Cl. 72—374 **4 Claims**



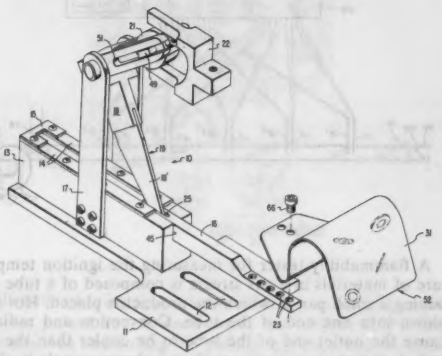
A method of forming a locking key to be received within a groove in a threaded fastener, by initially forming a mounting portion of the key to a width not substantially greater than the groove, and then locally upsetting a predetermined region of that mounting portion to form a widened fin adapted to cut an undercut guideway recess in the sidewall of the groove upon installation therein.

3,593,561

DIE PRESS PRODUCT EJECTION

Josef Roth, 13694 Settlement Acres Drive, Brookpark, Ohio

Filed Nov. 12, 1968, Ser. No. 774,753
Int. Cl. B21d *45/00*; B26d *7/06*
U.S. Cl. 72—427 **6 Claims**



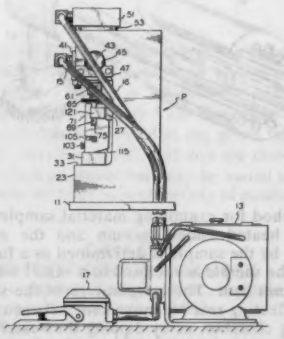
An ejecting mechanism for a die press that utilizes the vertical motion of the ram to create a linear sweep of an ejecting plate across the face of the die bed. The ejecting mechanism provides a simple mechanical arrangement of parts which transforms the vertical motion of the ram into a linear motion of a carriage carrying the plate. The carriage is adjustably designed to carry a bouncer plate which both lifts and propels small articles falling from the raised die or a puller plate which pulls articles onto its face and out of the die area.

3,593,562

SWAGING PRESS

John L. Williams, P.O. Box 572, and Anton Dresden, 2430 S. W. Summit Court, both of Lake Oswego, Oreg.

Filed July 18, 1969, Ser. No. 843,063
Int. Cl. B21j *9/06*
U.S. Cl. 72—447 **7 Claims**



A swagging press having an upright hydraulic power head pivotal away from a fixed anvil to an inclined inoperative position, and slidably carrying a guide block which slidably

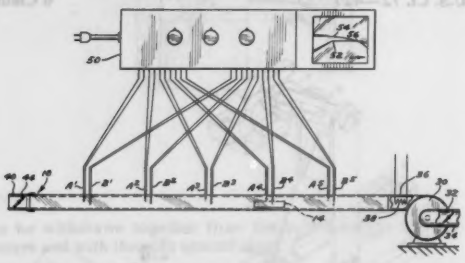
carries a pair of swagging dies, which are readily replaced in the inoperative position of such power head.

3,593,563

FLAMMABILITY TESTER

Ralph A. Marmor, and David K. Cunningham, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed July 12, 1968, Ser. No. 744,386
Int. Cl. G01n *1/00*
U.S. Cl. 73—15.4 8 Claims



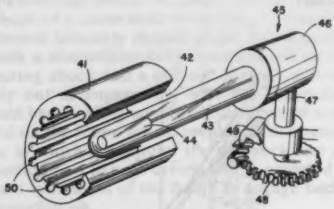
A flammability tester for measuring the ignition temperature of materials in a gas stream is composed of a tube containing a small pan in which the product is placed. Hot air is blown into one end of the tube. Convection and radiation cause the outlet end of the tube to be cooler than the inlet end. A temperature sensor such as a thermocouple is placed in the pan. A second temperature sensor is placed in the airstream immediately above the pan. When the hot airstream heats the material being tested to a sufficiently high temperature, the material ignites. The temperature within the product then rises above the temperature of the surrounding airstream thereby defining the ignition temperature.

3,593,564

METHOD AND APPARATUS FOR EXAMINING MATERIAL SAMPLES

Thaddaus Kraus, Vaduz, Liechtenstein, assignor to Balzers Patent- Und Beteiligungs Aktiengesellschaft, Balzers, Liechtenstein

Filed Jan. 16, 1969, Ser. No. 791,674
Claims priority, application Switzerland, Jan. 18, 1968, 969/68
Int. Cl. G01n *7/14, 25/22*
U.S. Cl. 73—19 4 Claims



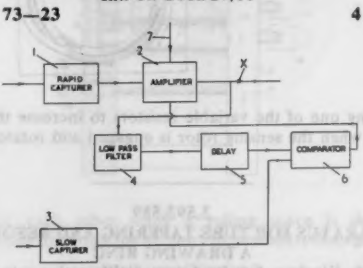
In a method for examining material samples, wherein the sample is heated under vacuum and the amount of gas exchanged by the sample is determined as a function of temperature, the sample is enclosed in a vessel which is permeable to radiant heat. The temperature of the sample is regulated by effecting relative movement between the vessel and the heating chamber, as by dipping the vessel into a heating chamber, raising and lowering a heating bell with respect to the vessel, or swinging the vessel laterally into and out of a laterally opening heating chamber. The apparatus includes the vessel, the heating chamber, and the means for effecting relative movement between the vessel and the heating chamber, in addition to the known evacuating and measuring means.

3,593,565

METHOD FOR MONITORING THE REFINING OF PIG IRON

Roland Holper, Seraing, Belgium, assignor to Centre National de Recherches Metallurgiques, Brussels, Belgium

Filed Mar. 17, 1969, Ser. No. 807,820
Claims priority, application Belgium, Mar. 22, 1968, 712694
Int. Cl. G01n *27/00*
U.S. Cl. 73—23 4 Claims



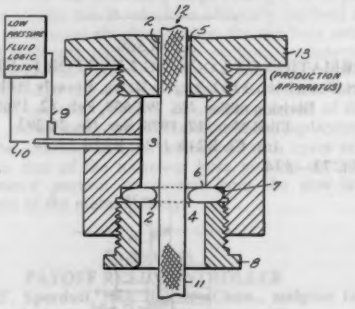
A method for monitoring the operation of refining pig iron characterized in that for the purpose of evaluating the rate of decarburization of the pig iron, use is made of a first capturer the time lag of which is very small and the pass band wide; and the drift of the values supplied by this first capturer is determined and compensated, by means of data supplied by a second capturer the accuracy of which is greater than that of the first capturer.

3,593,566

MEANS FOR AND METHOD OF GAUGING ARTICLES

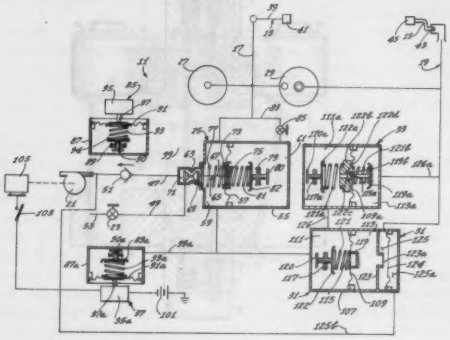
Pieter Jacob Loopuyt, Johannesburg, Republic of South Africa, assignor to African Explosives and Chemical Industries Limited, Johannesburg, Transvall, Republic of South Africa

Filed Jan. 22, 1969, Ser. No. 793,140
Claims priority, application South Africa, Jan. 31, 1968, 68/688
Int. Cl. G01b *13/08*
U.S. Cl. 73—37.7 13 Claims



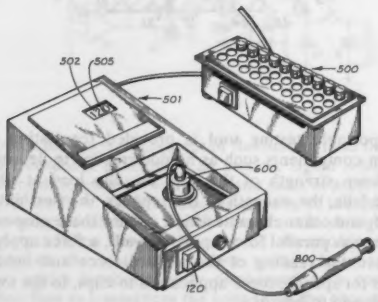
A gauging device senses dimensional measurements of elongate articles by detecting variations in the rate of escape of a fluid from a passageway through which the elongate article passes. Fluid is admitted into a chamber in the passageway in a controlled constant supply, and a flow of the fluid is received in a fluid logic circuit to detect any changes in rate of flow. A method of sensing changes in dimensional measurements utilizes this type of gauging device.

3,593,567
LEAK CHECKER
Ezra D Hartley, 2700 Jalmia Drive, Los Angeles, Calif.
Filed June 9, 1969, Ser. No. 831,288
Int. Cl. G01m 3/28
U.S. Cl. 73—40 12 Claims



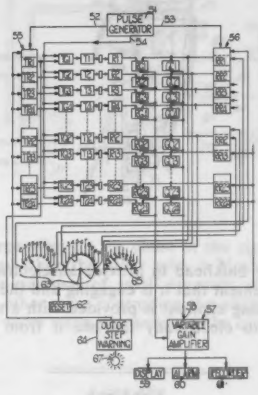
A leak checker for checking the static and pitot pressure systems of an aircraft for leaks which has first and second conduit means connectable respectively to the static and pitot pressure systems of the aircraft and a control valve for limiting the rate of evacuation or pressurization of the static pressure system. An indicator is operatively coupled to one of said conduits for providing an indication of leakage into or out of the pressure system. The checker also includes a valve limiting the maximum differential pressure between the two conduits and to prevent the pressure in the first conduit from substantially exceeding the pressure in the second conduit.

3,593,568
PROTHROMBIN TIME MEASURING APPARATUS WITH MEANS TO START THE TIMER IN RESPONSE TO THE INITIAL DECREMENT OF OPTICAL TRANSMISSIVITY
William D. Schmitz, Indianapolis; Lewis E. Bovard, Lawrence, and Larry G. Durkos, Lawrence, all of, Ind., assignors to Bio-Dynamics, Inc., Indianapolis, Ind.
Filed Apr. 1, 1969, Ser. No. 812,056
Int. Cl. G01n 31/14, 33/16
U.S. Cl. 73/6401 8 Claims



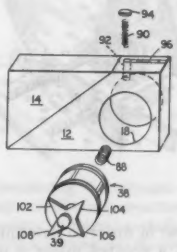
A coagulation meter including automatic means for maintaining the test temperature at 37° C. A photocell is used to sense the change in turbidity of the contents of a cuvette. The test is started by the change in voltage output produced by the photocell when the final test component is injected into the cuvette and is ended by the change in photocell voltage output caused by the change in turbidity produced by clotting. The time between these two events is measured by a digital time circuit and display automatically actuated by a differentiation circuit and a detector circuit.

3,593,569
ULTRASONIC TESTING APPARATUS
Donald Malcolm Wilson, Linton, England, assignor to S.T.D. Services Limited
Filed Mar. 11, 1968, Ser. No. 712,085
Int. Cl. G01n 29/04
U.S. Cl. 73—67.7 4 Claims



Ultrasonic-testing apparatus in which a series of transducers are pulsed and scanned under the control of two ring counters, one controlling the pulsing sequence and the other controlling the scanning sequence, with a device for varying the phase relationship of the counters to vary the mode of testing.

3,593,570
ULTRASONIC TESTING DEVICE
Richard W. Megoloff, 763 Taylor Ave., Alameda, Calif.
Filed June 13, 1969, Ser. No. 833,085
Int. Cl. G01n 29/04
U.S. Cl. 73—71.5 4 Claims

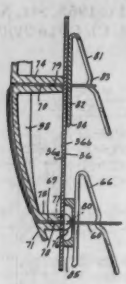


An ultrasonic-testing device including four crystals fixed to a member which may be rotated to a variety of positions. Each crystal when vibrated is adapted to emit ultrasonic waves of a frequency different from the other three. One crystal only is selectively vibrated at any given time, and the position of that vibrated crystal, and thus the direction of ultrasonic waves emitted therefrom, may be varied to an extent by rotation of the member to such variety of positions.

3,593,571
DRYNESS SENSOR ASSEMBLY
Jay A. Wiechert, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Aug. 4, 1969, Ser. No. 847,361
Int. Cl. G01n 5/02; F26b 13/10
U.S. Cl. 73—73 6 Claims

A bridging-type sensor assembly for use in domestic laundry dryer wherein a pair of sensing elements having leg

portions extending through an insulating mounting base and through a bulkhead of a drying chamber for engagement by resilient clips which secure the sensing assembly onto the bulkhead. At least one of the clips is provided with means for



biting into the bulkhead to provide an electrical ground for the sensing element that it is engaging and the leg portion of the other sensing element is provided with a second insulating member to electrically insulate it from the bulkhead member.

3,593,572

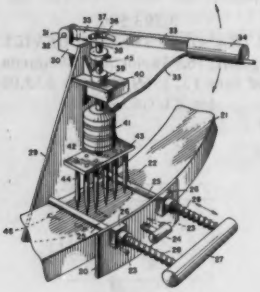
MEASURING THE TENDERNESS OF MEAT

Leo J. Hansen, Clarendon Hills, Ill., assignor to Armour and Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 705,722, Feb. 15, 1968, now abandoned. This application Nov. 15, 1968, Ser. No. 776,234

Int. Cl. G01n *3/48*

U.S. Cl. 73—81 **9 Claims**



To test raw meat in order to determine how tender it will be upon cooking, a pointed probe is pressed into the meat and the resistance of the meat to the movement of the probe is measured and the result compared with a standard established by similar tests on meat of the same class under similar conditions. The meat may be supported or suspended when the probe is introduced into the meat, and preferably the probe is pressed to a predetermined depth in the meat and at an angle to the grain of the meat. The apparatus employed may include retainer means for holding or suspending the meat to be tested, pointed probe means for penetrating the meat, stop means for limiting the extent of penetration to a predetermined depth, and means for measuring the force of the penetration.

3,593,573

FLUID PRESSURE END LOADING TEST APPARATUS

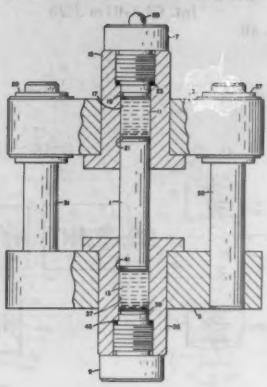
Richard E. Ely, Huntsville, Ala.

Filed Mar. 24, 1969, Ser. No. 809,854

Int. Cl. G01n *3/10*

U.S. Cl. 73—94 **5 Claims**

A fluid pressure end loading apparatus for axially testing cylinder specimens under compression loads. The apparatus includes a top plate having a fluid housing mounted thereon, a bottom plate also having a fluid housing mounted thereon



and guide pins for guiding the movement of the top plate. The specimen to be tested is mounted between the two fluid housings and the load is applied until the specimen fractures.

3,593,574

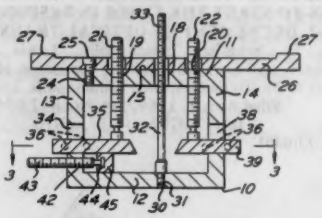
TESTING APPARATUS

Ray E. Omholt, Berwyn, Pa., assignor to Powerlock Floors, Inc., Philadelphia, Pa.

Filed Aug. 18, 1969, Ser. No. 850,953

Int. Cl. G01n *3/08, 3/24, 3/28*

U.S. Cl. 73—95 **5 Claims**



A portable testing tool is provided for testing flooring system components such as holddown clips to determine the holddown strength of the clip, the clip load at which the board fails, the strength of the tongues, the flexibility of the board, and other characteristics, and for these purposes has a frame with parallel force applying walls, a force applying unit adapted for reading of the applied force and holding elements for specific force application to clips, to the tongues of boards and to boards.

3,593,575

COMBINATION FLOW METER AND CONTROL VALVE

Horst R. Thieme, Horsham, Pa., assignor to Emerson Electric Co., St. Louis County, Mo.

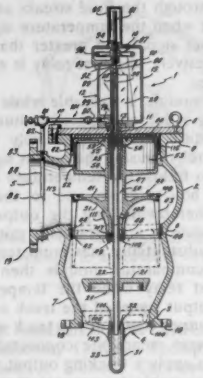
Filed Jan. 5, 1968, Ser. No. 696,030

Int. Cl. G01f *1/02*

U.S. Cl. 73—199 **19 Claims**

A combination variable area meter and flow limiter having a pilot valve plug and a readout magnet attached to a float rod of the variable area meter. Seating of the pilot valve plug in an adjustable pilot valve seat increases pressure in a con-

trol chamber, forcing down a skirt-guided plug and diaphragm assembly to limit the flow. A shutoff valve



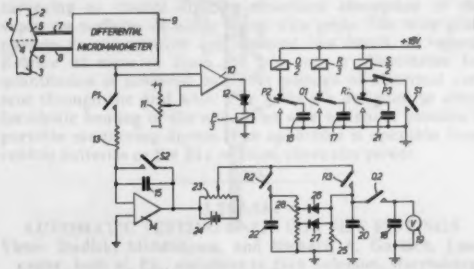
downstream of the pilot valve seat overrides the adjustable flow limit for shutoff without altering the flow limit setting.

3,593,576

APPARATUS FOR THE MEASUREMENT OF FLUCTUATING FLUID FLOW

James Robertson Bouvard Greer, Newton Mearns, Glasgow, Scotland, assignor to Mercury Electronics (Scotland) Limited

Filed July 8, 1968, Ser. No. 743,164
Claims priority, application Great Britain, July 13, 1967, 32,212/67
Int. Cl. G01f *1/04*
U.S. Cl. 73—206 **11 Claims**



Apparatus for the measurement of fluctuating fluid flow includes a transducer developing an electric signal related to the pressure difference between opposite sides of a barrier in the path of the flow. Switch means responsive to the onset of flow in a selected direction applies the transducer signal to an integrator. When flow in the selected direction ceases a switch applies the integrator output voltage to charge a capacitor, which is continuously discharged at a constant rate. When flow recommences the voltage on the capacitor is applied to control an indicator, which thus provides an indication of average flow rate in the selected direction.

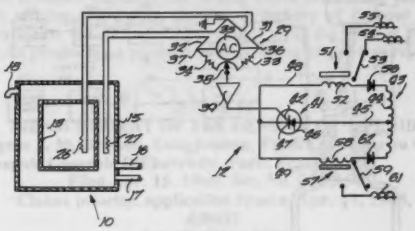
3,593,577

ADIABATIC CALORIMETER CONTROL SYSTEM

Ray J. Monner, Moline, Ill., assignor to Parr Instrument Co.., Moline, Ill.

Filed Apr. 22, 1968, Ser. No. 723,222
Int. Cl. G01k *17/00*
U.S. Cl. 73—190 R **8 Claims**

A control system utilized for an adiabatic calorimeter including a pair of thermistors positioned in the bucket and the jacket of a calorimeter and connected to an off-null electrical bridge circuit that actuates one of two relays controlling the flow of hot and/or cold water to the calorimeter jacket. A signal from the bridge indicating an imbalance in the thermistor temperatures is amplified in two stages and fed to



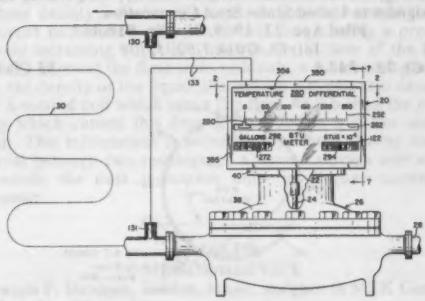
a thyristor. Depending on the phase of the signal, one relay will be actuated while the other relay is blocked; one relay controlling the addition of small amounts of hot or cold water and the other relay controlling the addition of a large amount of hot water when the sample in the calorimeter is ignited.

3,593,578

HEAT TRANSFER METERS

Thomas C. Farrell, Glenshaw, and Harry W. Fisher, Pittsburgh, both of, Pa., assignors to Emerson Electric Co., Saint Louis, Mo.

Filed May 9, 1968, Ser. No. 727,797
Int. Cl. G01n *1/00*
U.S. Cl. 73—190 **14 Claims**



An apparatus for measuring the amount of heat absorbed or given up by a heat-transferring structure such as a heat exchanger and comprising a wheel-and-disc-type integrator having a disc coupled to a volumetric flowmeter output shaft and a wheel positionable on the disc by a dual bellows assembly which measures the inlet and outlet temperatures of the heat exchanger. The position of the wheel represents the differential between the foregoing temperatures, and the integrator multiples the volume of fluid flowing through the heat exchanger by the temperature differential. A differential mechanism, having inputs respectively coupled to the output of the integrator and to the output of the flowmeter, has an output drive connected to a counter for totalizing the amount of heat transferred relative to the heat exchanger.

3,593,579

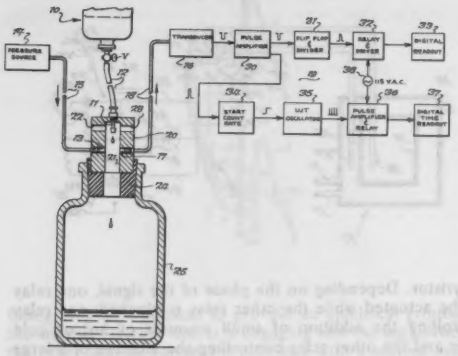
LIQUID DROP SENSING AND COUNTING SYSTEM

Daniel T. Hindman, Kenmore, and Paul J. Hufnagel, Getzville, both of, N.Y., assignors to Mennen-Greatbatch Electronics, Inc., Clarence, N.Y.

Filed July 16, 1969, Ser. No. 842,291
Int. Cl. G01f *3/00;* **A61m** *5/00*
U.S. Cl. 73—194 E **8 Claims**

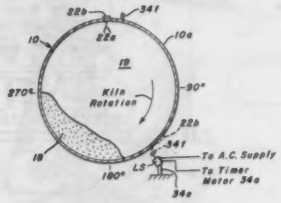
Apparatus for sensing and counting a flow of liquid drops including a nozzle communicating with the liquid to be mea-

sured and providing liquid drops in a first path. Gas under pressure in the range giving rise to a laminar flow is directed, as by a nozzle, in a second path positioned so as to be interrupted by the liquid drops. A pressure transducer in commu-



nication with the gas stream provides an electrical signal in response to each pressure decrease caused by a liquid drop interrupting the gas flow. The transducer is operatively connected to a suitable counter.

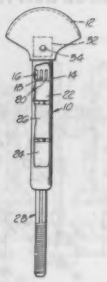
3,593,580
ELECTRONIC PEAK-PICKER
Norman C. Ludwig, deceased, late of Chicago, Ill. (by Ruth L. Ludwig, executrix), and Gillard Harrity, Valparaiso, Ind., assignors to United States Steel Corporation
Filed Apr. 22, 1969, Ser. No. 818,457
Int. Cl. G01k *7/02, 13/08*
U.S. Cl. 73—343.5 **35 Claims**



This invention relates to apparatus for determining the temperature of one of a kiln load and a heated fluid stream at a predetermined location on a longitudinal axis of a kiln having the heated fluid stream passing therethrough and for heating the kiln load. The apparatus has a temperature-responsive means connected to the kiln at the predetermined location and rotatable with the kiln to cyclically pass through the kiln load and the heated fluid stream to produce a temperature signal. A rate switch module is connected to the temperature-responsive means for producing a blocking output from an increasing voltage input from the temperature-responsive means while the temperature-responsive means is passing through the fluid stream and a tracking output from a decreasing voltage input from the temperature-responsive means while the temperature-responsive means is passing through the kiln load. Alternatively, the rate switch module produces a blocking output from a decreasing voltage input from the temperature-responsive means while the temperature-responsive means is passing through the kiln load and a tracking output from an increasing voltage input from the temperature-responsive means while the temperature-responsive means is passing through the heated fluid stream. In addition, the apparatus has a first relay, a comparator module connected to the temperature-responsive means and to the first relay, and a track and hold module connected to the temperature-responsive means and to the comparator module and operable to provide a substantially maximum output signal and a substantially minimum output signal to the comparator module when the temperature-responsive means is passing through the fluid stream and the kiln load respectively so that when the temperature signal is less than the maximum output signal and greater than the minimum output signal respectively, the first relay is energized by the comparator module.

The rate switch module is operable while the rate switch module is receiving a decreasing temperature signal and an increasing temperature signal respectively to produce the tracking output thereby causing the output signal of the track and hold module to follow the temperature signal being fed to the track and hold module and to then produce the blocking output, thereby holding the output signal of the track and hold module at a substantially minimum temperature signal and a substantially maximum temperature signal respectively. The comparator module then is operable to deenergize the first relay when the temperature signal is greater than the output signal of the track and hold module and less than the output signal of the track and hold module respectively, and reset means are connectable to the track and hold module to apply a tracking output to the track and hold module and operable to connect the track and hold module to a substantially maximum temperature signal and a substantially minimum temperature signal respectively, thereby producing a substantially maximum output signal and substantially minimum output signal respectively to the comparator module.

3,593,581
ELECTRICAL THERMOMETER
Leroy E. Beightol, Los Angeles, Calif., assignor to Solar Laboratories, Inc., Torrance, Calif.
Filed Jan. 10, 1969, Ser. No. 790,307
Int. Cl. G01k *7/16*
U.S. Cl. 73—362 **6 Claims**

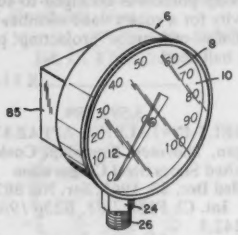


This patent describes an electrical thermometer device comprising an electrical circuit containing a disposable resistance element which is adapted to be inserted into an opening of the human body and which resistor undergoes changes in resistance as a result of a change in temperature produced therein by the human body.

3,593,582
COMBINATION PRESSURE-RESPONSIVE INDICATING AND ACTUATING DEVICE
Ramond J. Birkmeyer, Cincinnati, Ohio, assignor to Jay Instrument and Specialty Co., Cincinnati, Ohio
Filed Sept. 26, 1969, Ser. No. 861,306
Int. Cl. G01l *19/12*
U.S. Cl. 73—411 **13 Claims**

The gauge involves the use of two separate pressure-measuring members both of which are responsive to a single source of actuating pressure. One of said members actuates the pointer of an indicator whereas the other member simul-

taneously actuates a control member which in turn controls remotely located alarm, signal or other mechanisms. No



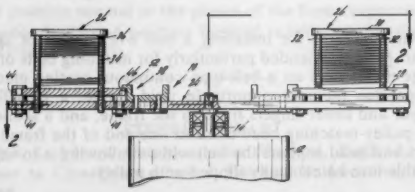
change is required in conventional mounting of the gauge, using a single connection to a pressure source.

3,593,583

MERCURY AIR SAMPLER FOR GEOLOGICAL STUDIES

Howard H. Anderson, Covina; Rudolph H. Moyer, West Covina; Donald J. Sibbett, Cucamonga, and David C. Sutherland, El Monte, all of, Calif., assignors to Geomet, Incorporated, Rockville, Md.

Filed Apr. 29, 1970, Ser. No. 32,918
Int. Cl. G01n *1/22*
U.S. Cl. 73—421.5 R **7 Claims**



Apparatus and system for detecting and sampling mercury vapor in the atmosphere especially adapted for geological surveying or studies utilizing sensitized absorption of the vapor on surfaces of noble metal wire grids. The wire grids operate to concentrate encountered low levels of vapors. Release of mercury from the grid into a photometer for quantitation is achieved by direct passage of electrical current through the grid wire. The grids are designed to allow for ohmic heating of the absorbent wire to render possible a portable monitoring device. The apparatus is operable from vehicle batteries or the like or from alternator power

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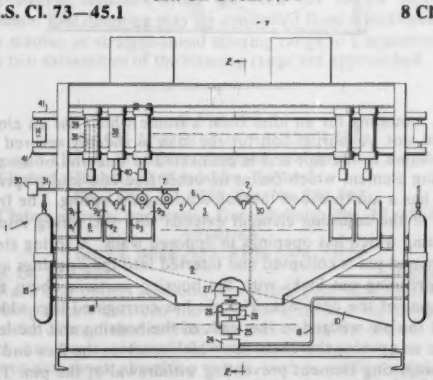
3,593,584

AUTOMATIC TESTING UNITS FOR PIPE FITTINGS

Victor Dudick, Middletown, and Richard A. Gerlach, Lancaster, both of, Pa., assignors to Jack Solomon, Harrisburg, Pa.

Filed Mar. 6, 1969, Ser. No. 804,806
Int. Cl. G01m *3/26*
U.S. Cl. 73—45.1 **8 Claims**



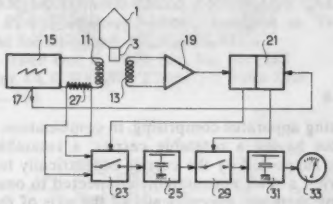
A new and improved testing system for pipe fittings including a battery of testing blocks into which fittings to be tested are placed, a battery of piston-cylinder units for holding the fittings in the blocks for a controlled period of time, a metering device for administering over a controlled period of time, fluid interior of the fittings and to a pressure-sensing unit. The sensing unit is then isolated by the metering device and upon a pressure change occurring in the sensing unit, a trapdoor is raised adjacent the testing block associated with the unit sensing a pressure change. A battery of kickout units then ejects the fittings being tested with the fittings of the blocks producing a pressure change being trapped as rejects.

3,593,585

MEASUREMENT OF THE DENSITY OF A FLUID

Eugene J. M. Bresson, Longjumeau, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Apr. 15, 1969, Ser. No. 816,254
Claims priority, application France, Apr. 17, 1968, 428425
Int. Cl. G01n *9/08*
U.S. Cl. 73—453 **4 Claims**



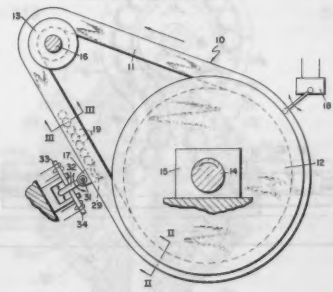
A float fitted with a magnet is immersed in the liquid whose density is to be measured. A generator sends a ramp current periodically to a main coil, thus causing a progressively increasing attraction towards the bottom of the float. At the moment the float sinks suddenly, a moment depending on the density of the liquid, the sudden movement is detected by a second coil which sets a flip-flop. At this time the intensity which caused this drop is recorded in a buffer storage unit. This information is subsequently stored, during the interval between two readings, in a second storage unit which controls the data indication units in a quasi-continuous manner.

3,593,586

MEMORY DEVICE

Francis P. Dunigan, Holden, Mass., assignor to MEK Control, Inc., Northboro, Mass.

Filed Feb. 13, 1969, Ser. No. 799,009
Int. Cl. F16h *37/00*
U.S. Cl. 74—1 R **7 Claims**



A memory device consisting of a moving, endless belt, spheres slidably positioned in the belt, a finger which causes one of the spheres to be nonslidably positioned in the belt, and a sensor adjacent to the belt which detects when a sphere passes by.

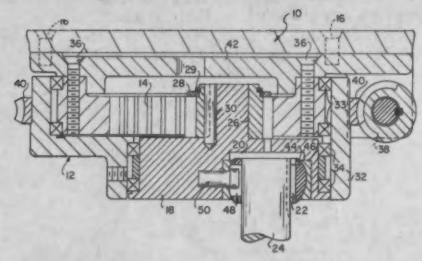
ERRATA

For Classes 118—206, 118—630, 118—2, see:
Patent Nos. 3,593,677 thru 3,593,680

3,593,587
INDEXING APPARATUS

Robert R. Henry, Andover, Mass., assignor to Yorkshire Industries Inc., Andover, Mass.

Filed Sept. 29, 1969, Ser. No. 861,643
Int. Cl. G01c *19/02;* **G05g** *1/00*
U.S. Cl. 74—22 **16 Claims**

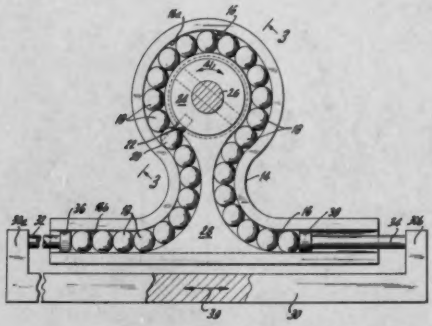


Indexing apparatus comprising, in combination: adjustment apparatus having a rotatable carrier, a rotatable mounting member supported by the carrier eccentrically to the axis of the carrier, a shaft nonrotatably connected to one side of the mounting member, eccentrically of the axis of the mounting member, the carrier and shaft axes being parallel to and equidistant from the axis of the mounting member, and on the other side of the mounting member, a pinion coaxial with the mounting member and nonrotatably connected thereto and an internal gear in driving engagement with the pinion, and mounted coaxially of the carrier and nonrotatably relative thereto, the pinion having a pitch diameter of one half that of the internal gear, and the shaft axis lying in the pitch circle of the pinion drive means connected to the carrier for rotating the carrier; at least one drive member coaxially connected to the shaft nonrotatably in the direction of rotation of the shaft; and, an endless loop in driving engagement with each drive member.

3,593,588
ACTUATOR USING ROLLER TRANSMISSION

Alexander B. Hulse, 55 Austin Pl., Staten Island, N.Y.

Filed May 8, 1969, Ser. No. 823,068
Int. Cl. F16h *27/02;* **F16c** *1/10*
U.S. Cl. 74—89 **10 Claims**

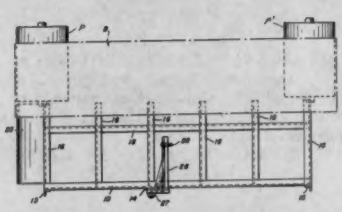


An actuator includes a closed circulating ball or roller system arranged in a defined path, particularly a combined arcuate and linear path, constructed to facilitate a linear and rotary motion change. In one embodiment, the actuator includes a housing defining a closed ball channel which includes a central loop portion for transmitting rotary motion and one or more end linear portions for transmitting linear motion. The loop portion is arranged to surround a central cylindrical cavity for a rotary vane member or disc which includes a radially outwardly projecting portion which is formed with a ball head.

3,593,589
BELT-INSTALLING APPARATUS

Norris R. Logan, Thornton Township, Cook County, Ill., assignor to United States Steel Corporation

Filed Dec. 23, 1969, Ser. No. 887,471
Int. Cl. F16h *7/08;* **B23p** *19/00*
U.S. Cl. 74—242.5 **4 Claims**

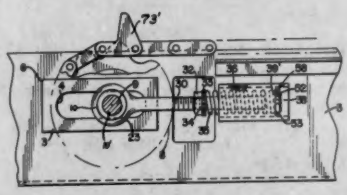


An apparatus for installing a belt over a pair of spaced apart pulleys, intended particularly for installing belts of thin-gage metal strip on a belt-type continuous casting machine. Apparatus includes a portable rigid frame, a plurality of upper and lower fingers fixed to the frame, and a semicircular pulley-matching head fixed to one end of the frame. Fingers and head support the belt without allowing it to sag and enable it to be manually slipped onto pulleys.

3,593,590
IDLER ASSEMBLY

Elmer M. Kesl, and Carmen S. Phillips, both of Downers Grove, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Mar. 3, 1970, Ser. No. 16,177
Int. Cl. F16h *7/10, 7/12*
U.S. Cl. 72—242.14 R **10 Claims**



A mounting for an idler from a frame which has an elongated slot. A journal bolt for the idler is slidably secured to the frame in the slot and is connected to one end of an adjusting element which fits at its other free end into a spring and has a nut threaded thereon abutting the spring. The free end of the adjusting element extends with the spring into a housing which has openings in opposed walls. A spring steel U-shaped pin is collapsed and inserted into the openings and in spreading out locks with the housing portions about the margins of the openings. The pin has corrugated legs which hold the pin wedged to the walls of the housing and the legs form an opening therebetween which receives the free end of the adjusting element preventing withdrawal of the pin. The pin seats the other end of the spring and the threaded nut adjusts the compression of the spring.

3,593,591

ADJUSTABLE MOUNTING MEMBER AND A SELF-ALIGNING SHAFT-BEARING ASSEMBLY

Alfred Chantland, Humboldt, Iowa

Filed Mar. 12, 1970, Ser. No. 18,937
Int. Cl. F16h 7/10
U.S. Cl. 74—242.15 R 4 Claims

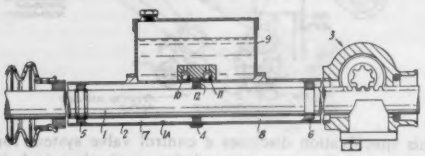
A mounting member and an associated self-aligning shaft bearing are provided at each end of a rotatable shaft. The mounting members have one of their ends pivoted on upright parallel frame supports for swinging movement of their opposite ends in planes parallel to the planes of the frame supports. With the self-aligning bearings located adjacent to such opposite ends the mounting members are relatively movable to swing the axis of the rotatable shaft to a first adjusted position normal to the planes of the frame supports or to a second adjusted position inclined relative to the planes of the frame supports.

3,593,592

STEERING GEAR

Fredrick J. Adams, Campton, near Shefford, England, assignor to Cam Gears Limited, Hitchin, Hulfordshire, England

Filed Dec. 5, 1969, Ser. No. 882,547
Claims priority, application Great Britain, Dec. 6, 1968, 57988/68
Int. Cl. B62d 3/12
U.S. Cl. 74—498 12 Claims



Rack and pinion steering gear with fluid damping to absorb undesirable feedback from the rack bar to the steering column. The damping may be controlled from a maximum in the median or straight-ahead steering range to a minimum as the two extremities of the steering range are approached.

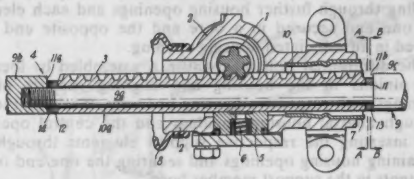
3,593,593

RACK AND PINION ASSEMBLIES

Kenneth Clifton Bradshaw, England, assignor to Cam Gears Limited, Hitchin, Hertfordshire, England

Filed Dec. 12, 1969, Ser. No. 884,761
Claims priority, application Great Britain, Dec. 12, 1968, 59141/68
Int. Cl. B62d 1/20; F16h 1/04, 55/14
U.S. Cl. 74—498 9 Claims

Rack and pinion automotive steering gear with shock absorbing means between the rack bar and rack for damping transfer of road shocks from the rack bar to the pinion. The rack bar has a reduced diameter portion receiving a rack sleeve and shock absorbing means, such as resilient washers, are interposed between the ends of the sleeve and shoulders of the rack bar. The rack bar is preferably cylindrical, and the reduced diameter portion thereof has an eccentric axis. The rack sleeve is preferably cylindrical with an eccentric bore so located to provide a thick rack tooth wall and to position the external cylindrical sleeve surface concentric and flush with the main rack bar. The bar and sleeve are slidably supported in a spring biased yoke.

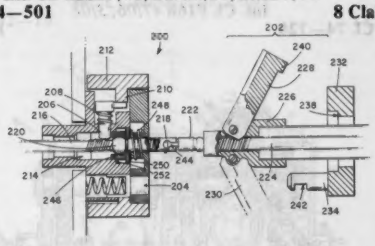


3,593,594

APPARATUS FOR MANIPULATING RADIOACTIVE MATERIAL TO AND FROM A STORAGE UNIT

George J. Perry, Sudbury, Mass., assignor to Technical Operations Incorporated, Burlington, Mass.

Filed Oct. 4, 1968, Ser. No. 765,245
Int. Cl. G21h 5/00; F16c 1/10; F16b 7/04
U.S. Cl. 74—501 8 Claims



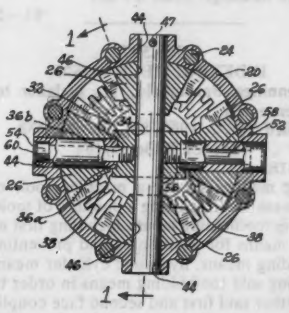
Apparatus for manipulating radioactive materials to and from a storage unit and more particularly, novel features in a coupling unit for coupling propulsion means for the source to the source and its storage unit. Structures are shown for rendering the coupler fail-safe to prevent coupling of the propulsion means with the storage unit unless a propelling cable and the source are properly connected; other structures are shown for preventing decoupling except when the source is in its storage unit and for facilitating connection of the propelling cable with the source.

3,593,595

DIFFERENTIAL GEARING MECHANISM AND METHOD OF ASSEMBLY

Eugene D. Taylor, Kenosha, Wis., assignor to J. I. Case Company

Filed Aug. 19, 1969, Ser. No. 851,282
Int. Cl. F16h 1/40
U.S. Cl. 74—713 5 Claims



A differential gearing mechanism including pinion gears supported in a housing by a pinion support member. The sup-

port member comprises a central member having an axial opening and a pair of bores disposed on axes angularly related to the axial opening. The central opening receives a pin which also extends through coaxial openings in the housing and supports a pair of pinion gears. The support member further includes a pair of support elements respectively extending through further housing openings and each element has one end secured in a bore and the opposite end supported in an associated housing opening.

The differential gear mechanism is assembled by locating the pinions in the housing and aligning support pinion openings with respective housing openings, inserting the pin through coaxial housing openings and the central opening, and inserting the respective support elements through the remaining housing openings and securing the one end of the elements in the support member bore.

In a modified form, the central member includes a plurality of bores angularly related to each other and each receiving a pinion support element.

3,593,596

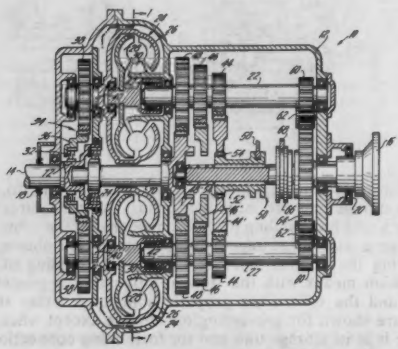
POWER TRANSMISSION MECHANISM

Keith W. Race, Hagerstown, Md., and Delbert E. Willis, deceased, late of Hagerstown, Md. (by Marie E. Willis, executrix), Hagerstown, Md., assignors to Mack Trucks, Inc., Allentown, Pa.

Filed Dec. 15, 1969, Ser. No. 885,233

Int. Cl. F16h *47/06, 3/08*

U.S. Cl. 74—720 **16 Claims**



A power transmission mechanism having mechanical and hydraulic drive paths comprising a pinion shaft drivingly connected to a plurality of countershafts and a hydraulic torque converter drivingly connected to each countershaft by a one-way clutch. The torque converters and the pinion shaft are disposed for selective engagement with an input shaft by means of clutches. In an alternative arrangement, a clutch selectively connects each converter rotor to its impeller and another clutch selectively grounds each converter stator to the transmission housing.

3,593,597

INDEXING MECHANISM

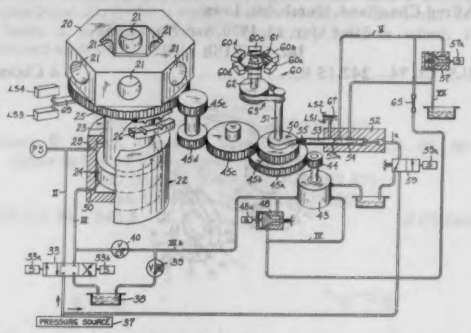
Richard F. Jennings, Springfield, Vt., assignor to Tertron, Inc., Providence, R.I.

Filed Nov. 7, 1967, Ser. No. 681,238

Int. Cl. B23q *17/18*

U.S. Cl. 74—818 **9 Claims**

An indexing mechanism for a machine tool, comprising toolholding means for supporting a plurality of tools mounted for rotation, the toolholding means including first and second face coupling means for positioning and preventing rotation of the toolholding means, hydraulic cylinder means for raising and lowering said toolholding means in order to separate and bring together said first and second face coupling means, said toolholding means being rotatable when said first and second face coupling means are separated, gear drive means for rotating said toolholding means and for indexing the same, hydraulic motor means for driving said gear drive means, and flow valve means having a spool responsive to



cam means driven by said gear drive means for controlling said hydraulic motor means.

3,593,598

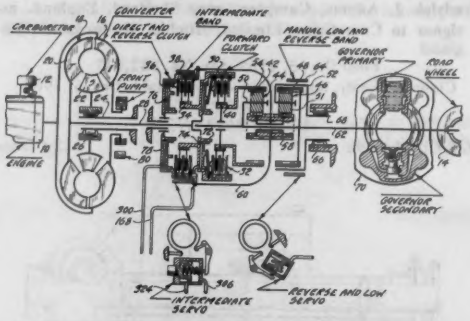
AUTOMATIC POWER TRANSMISSION CONTROLS

William C. Winn, Inkster, and Stanley D. Rosen, Farmington, both of, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of application Ser. No. 747,340, July 24, 1968, now abandoned. This application Aug. 5, 1969, Ser. No. 850,692

Int. Cl. B60k *21/08*

U.S. Cl. 74—864 **6 Claims**



This specification discloses a control valve system for a geared, automatic, power transmission mechanism, including fluid pressure operated clutches and brakes for establishing various speed ratios. During operation in the lowest speed ratio, the gearing torque reaction is accommodated by a friction brake that acts as the reaction point also during reverse drive. A servo pressure modulator establishes the optimum servo pressure during forward drive acceleration in the lowest speed ratio. Provision is made for overruling the pressure modulating action of the modulator during reverse drive, thereby causing an increase in the servo operating pressure to accommodate the increased reaction torque requirement during reverse drive.

3,593,599

HYDRAULIC GEAR-SHIFT CONTROL FOR AUTOMOTIVE TRANSMISSION SYSTEMS

Hansjorg Dach, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedeichshafen Aktiengesellschaft, Friedrichshafen, Germany

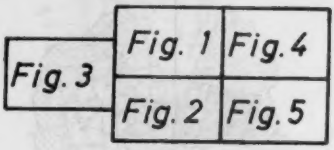
Continuation-in-part of application Ser. No. 817,981, Apr. 21, 1969. This application July 28, 1969, Ser. No. 845,464

Int. Cl. B60k *21/10;* **F16h** *57/10*

U.S. Cl. 74—869 **23 Claims**

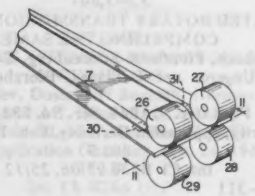
Hydraulic oil from a motor-driven pump is fed to a main valve (10) which delivers it to a hydraulic torque converter

(W), inserted between the drive motor and the transmission input shaft of an automotive vehicle, and to a set of fluid-operated clutches (K1, K2) and brakes (B1, B1F, B2) at a supply pressure determined by the stress of a pair of biasing springs (27*a*, 27*b*) and by the output pressure of a throttle valve (40) responding to the position of the vehicular accelerator. Two cascaded switching valves (70, 90), normally responding to speed-dependent fluid pressure from a regulator (PR) driven by the transmission output shaft, are biased by load-dependent fluid pressure from the throttle valve in a partly depressed position of the accelerator to create a



hysteresis effect which permits switchover between first and second gears, and between second and third gears, at relatively high speeds during upshifting and at relative low speeds during downshifting, the hysteresis effect being partly canceled in a fully depressed (kickdown) throttle position; upon the shifting of a speed selector (30) from "automatic" position (A) to a manual position "1" or "2," this load-dependent bias on either or both switching valves is overridden by a fixed fluid pressure from either of two blocking valves (50, 60). Dampers (120, 140, 160, 170) are provided to control the rate of activation of the hydraulic clutches and brakes.

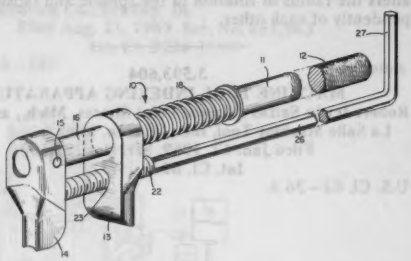
3,593,600
BAND SAW BLADE APPARATUS AND METHODS
Clyde M. Adams, Jr., Milwaukee, Wis.; Norman S. Hewitt, Chicago, Ill., and George F. Bartimes, Chicago, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 29, 1969, Ser. No. 821,552
Int. Cl. B23d *63/00*
U.S. Cl. 76—112 **9 Claims**



A method of making a band saw blade by welding strips of high-speed steel to a wide strip of flexible back-forming strip material. The strips of high-speed steel are welded in opposed relationship to opposite sides of the backing material and in opposed relationship at the edge of the flexible back-forming strip material. The composite band saw stock is now cut down the middle of the high-speed strip and the middle of the backing material to form the band saw blank for two or more band saw blades. The composite band saw blank is then milled to give teeth of the desired size and pitch with their cutting edges and top portions of high-speed steel. The base of the teeth, like the backing band, is made of the less tempered material.

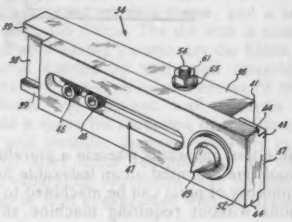
3,593,601
WRENCH
Frederick R. McFarland, Lancaster, Pa., assignor to K-D Manufacturing Company, Lancaster, Pa.
Filed Jan. 7, 1969, Ser. No. 789,566
Int. Cl. B25b *13/48, 13/16*
U.S. Cl. 81—72 **3 Claims**

A device is disclosed, for use in operation in a manner generally similar to that of a wrench, comprising opposed relatively moveable jaws carried on a lever arm, with means being provided for adjusting the positions of the jaws relative to one another and for applying gripping forces, whereby



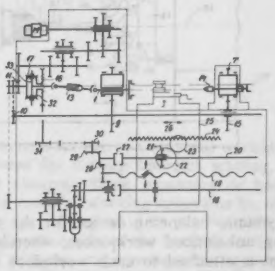
various apparatus may be gripped, particularly for engagement inside bores of disc brake pistons, for removal of the same.

3,593,602
TAPER ATTACHEMENT FOR A TURNING LATHE
Stanley John Westrom, 918 Douglas, Des Moines, Iowa
Filed Mar. 24, 1969, Ser. No. 809,772
Int. Cl. B23b *5/38, 23/02*
U.S. Cl. 82—15 **1 Claim**



The taper attachment provides a center on the tailstock of a turning lathe that enables the operator to quickly set up the lathe for cutting tapers over the full length of the lathe bed without requiring any movement or setting of the tailstock. The attachment includes a baseplate that has a sideplate provided with a tapering center. The baseplate is mounted on the tailstock quill with the slide plate horizontally movable transversely of the lathe to move the tapering center from a coaxially aligned position with the quill axis to an adjusted position providing for a desired taper cut.

3,593,603
TURNING MACHINE FOR MACHINING WORKPIECES OF MULTICONTOURED CONFIGURATIONS
Karoly Gellert, Miskolc, Hungary, assignor to Licencia Talalmanyokat Ertekesito Vallalat, Budapest, Hungary
Filed Oct. 7, 1968, Ser. No. 765,430
Int. Cl. B23b *3/28*
U.S. Cl. 82—18 **1 Claim**



A lathe for producing multicontoured workpieces comprises a working spindle and a tailstock for rotatably support-

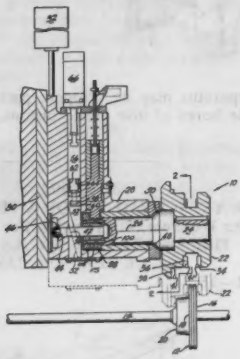
ing opposite ends of the workpiece, the spindle and tailstock being independently mounted for rotation in a pair of eccentric sleeves whose adjustment about the axis of the workpiece alters the radius of rotation of the spindle and tailstock independently of each other.

3,593,604

MACHINE TOOL INDEXING APPARATUS

Robert Irwin Sattler, Grosse Point Shores, Mich., assignor to La Salle Machine Tool, Inc., Warren, Mich.

Filed Jan. 17, 1969, Ser. No. 792,100
Int. Cl. B23b *29/32*
U.S. Cl. 82—36 A **10 Claims**



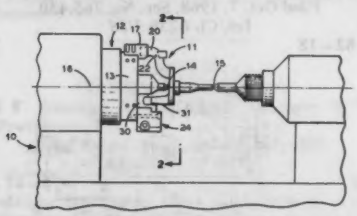
Machine tool apparatus wherein a plurality of sequentially usable tools are mounted on an indexable turret head so that a large number of parts can be machined to exactly the same dimensions without requiring machine shutdown for tool replacement purposes. The apparatus includes a rotatable indexable spindle for rotating the head so as to place a new set of tools in operative position and means for moving the spindle axially to a predetermined fixed position in which the indexable tools are precisely located along the spindle axis. Apparatus is disclosed wherein the spindle is both rotated and moved axially to precise positions in response to actuation of a single motor.

3,593,605

APPARATUS FOR DYNAMICALLY BALANCING A ROTATING WORKPIECE

Sylvester Ray Cudnohufsky, Pontiac, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jan. 29, 1969, Ser. No. 794,884
Int. Cl. B23b *33/00*
U.S. Cl. 82—40 R **8 Claims**



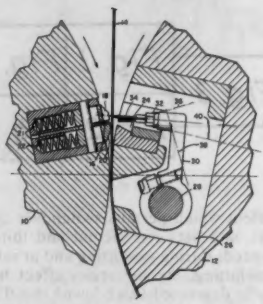
A dynamic balancing device for the mass production of rotating unbalanced workpieces, wherein a counterbalance element is attached to each workpiece during the working procedure to compensate for the unbalance. The counterbalancing effect is preferably applied perpendicular to the axis of workpiece rotation, and in the same plane as the center of gravity of the workpiece unbalance to avoid runout of the workpiece during the machining process.

3,593,606

WEB FEEDING MECHANISM

William B. Raybuck, 200 North Lansdowne Ave., Lansdowne, Pa.

Filed June 6, 1969, Ser. No. 830,945
Int. Cl. B65h *35/08*
U.S. Cl. 83—154 **3 Claims**



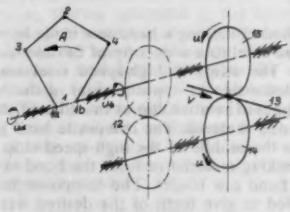
Male and female cutting cylinders, an elongated cutter disposed longitudinally of the male cylinder, and longitudinally spaced impaling pins carried by the female cylinder for impaling the web, in advance of its engagement with the cutter, to hold a sheet severed from the web, and to release it to a folder or other mechanism, or to delivery. The impaling pins are so arranged that during penetration of the web, the axes of the pins will form angles of 90°, or slightly more, with the vertical plane of the web which moves downwardly between the cylinders.

3,593,607

ARTICULATED ROTARY TRANSMISSION AND SHEARS COMPRISING THE SAME

Curt Munchbach, Pforzheim-Sonnenberg, Germany, assignor to Irma Ungerer nee Dollinger, Pforzheim, Arlingerstr, Germany

Filed Dec. 9, 1968, Ser. No. 782,328
Claims priority, application Germany, Feb. 10, 1968, P 16 50 881.9
Int. Cl. B23d *25/06, 25/12*
U.S. Cl. 83—311 **9 Claims**



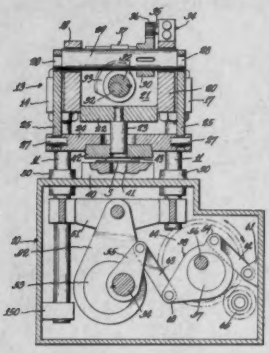
A quadrilateral linkage comprises a double articulated joint having input and output members which are mounted on a common central axis for rotation relative to each other, an outer articulated joint adapted to revolve about said axis, and first and second lateral articulated joints connecting said outer articulated joint to said input and output members, respectively. The outer articulated joint is movable to vary the distance between it and said double articulated joint and thus to vary the relation of the angular velocities of said input and output members.

3,593,608

PRESS APPARATUS

Robert Soman, Warren, Ohio, assignor to Wean Industries, Inc.

Filed July 3, 1969, Ser. No. 838,866
Int. Cl. B26d 7/02
U.S. Cl. 83—375 10 Claims



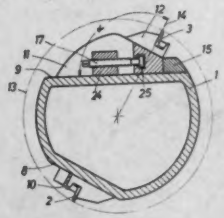
Blanking apparatus for highly accurate blanking operations and the like having a punch holder supporting a punch movable toward and away from a workpiece and such punch holder carrying with it, during a portion of its movement, a pressure applying member which exerts a strong compressive or restraining force on the workpiece during the interval that the punch is piercing the workpiece. During a portion of punch holder movement, pressure applying member movement therewith is arrested whereby relative movement between the pressure applying member and the punch holder occurs. The present invention provides novel means which prevents cocking or tilting the pressure applying member during relative movement between the latter and the punch holder.

3,593,609

CROSSCUTTING ASSEMBLY EMBODYING ROTARY KNIFE MEANS

Herbert Schonmeier, Dusseldorf-Benrath, Germany, assignor to Jagenberg-Werke AG, Dusseldorf, Germany

Filed Feb. 20, 1969, Ser. No. 800,859
Claims priority, application Germany, Feb. 24, 1968, P 16 11 770.7
Int. Cl. B26d 1/12
U.S. Cl. 83—563 6 Claims



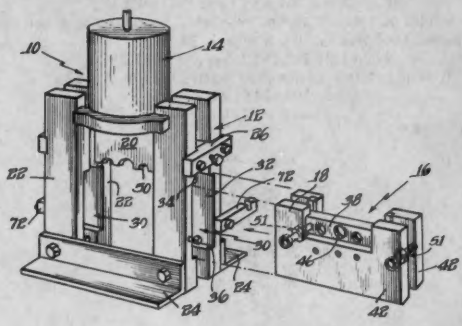
A rotary crosscutting assembly for cooperation with a counter knife in cutting a moving web of paper, cardboard or like material comprising rotary head means, at least two knife means carried by and extending longitudinally of said head means, means mounting one of said knife means for displacement in a tangential direction relative to the axis of rotation of said head means to impart compound movement to said one knife means relative to the axis of said head means between an operative cutting position at a particular radial distance from said axis to an inoperative position at a lesser distance from said axis and means for releaseably holding said one knife means at said positions.

3,593,610

METAL FABRICATING APPARATUS

Raymond L. Valente, Kankakee, Ill., assignor to Manco Manufacturing Co., Bradley, Ill.

Filed Aug. 21, 1969, Ser. No. 851,983
Int. Cl. B23d 35/00
U.S. Cl. 83—580 14 Claims



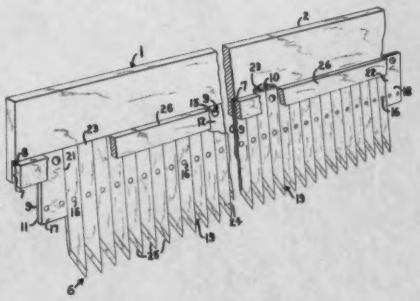
Metal fabricating apparatus of the type which include a frame, a die unit supported on said frame, and a ram assembly mounted atop said frame. The die unit is comprised of an anvil arrangement having a stationary die blade, and a shear blade member carried by said anvil assembly and adapted for connection to a reciprocal member of the ram assembly. The frame has opposed wall portions which cooperate to define a space for reception of the die unit. In addition, the die unit includes opposed relatively movable elements, such that after initial reception of the die unit within said space, separating movement may be utilized to force said elements in firm engagement with the frame wall portions.

3,593,611

CUTTING BLADE STRUCTURE

Leonard G. Sagehorn, Kansas City, Mo., assignor to Industrial Grinding & Supply Co., Kansas City, Mo.

Filed Sept. 15, 1969, Ser. No. 857,955
Int. Cl. B26d 1/06
U.S. Cl. 83—697 6 Claims



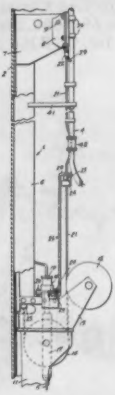
A cutting blade structure for use in a material working apparatus, such as a shear for cutting fiberglas matting. The cutting blade has an elongate blade mounting or backing member secured in the material working apparatus for movement toward and away from material to be cut. A pair of end members are mounted on one side of the backing member at opposite ends thereof with the end members having substantially parallel facing edges for facilitating positioning a plurality of cutting blades or members between the end members. The cutting members each are secured to the backing member and have sharpened free ends extending beyond the

backing member for cutting the respective material. The cutting members are elongate and have their free ends inclined relative to the long dimension thereof with each cutting member forming one tooth of a saw tooth edge of the cutting blade structure.

3,593,612
SEALING AND ANCHORING DEVICE
Karl Peter Schulze, Carrum, Victoria, Australia, assignor to Illinois Tool Works, Inc., Chicago, Ill.
Filed July 29, 1969, Ser. No. 847,002
Claims priority, application Australia, July 31, 1968, 41481/68
Int. Cl. F16b *13/04*
U.S. Cl. 85—80 **1 Claim**

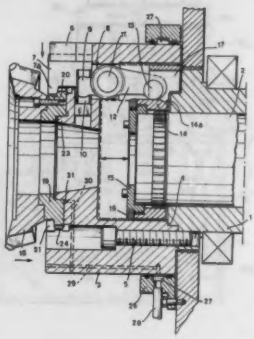
The invention is in an improved device for providing an anchor for a screw or the like and for providing a fluidtight seal to a panel into which it is inserted. The device has a body portion adapted to be engaged in the panel and has means on the outer surfaces thereof to engage the panel and provide a secure anchorage thereto and operable to provide a fluidtight seal with the panel.

3,593,613
ADJUSTING TOOL
Oscar L. Davis, 7603 Mazaltan, El Paso, Tex.
Filed Feb. 25, 1969, Ser. No. 802,010
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.811 **8 Claims**



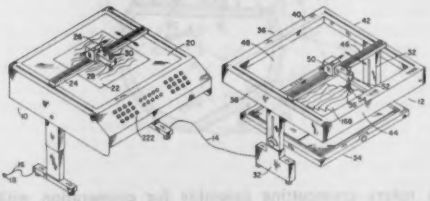
A tool for automatically adjusting the required slack in umbilical cables for their separation from a missile in a launching shell using spring actuated cable retractors and consists of a flat bar having notched, oppositely turned end portions. The tool is inserted over the explosive nut assembly at one end, the other end engaging the wire cable separation rope which is attached to the cables and to the retractor. By taking up the slack of the cables until the wire rope engaging end of the tool stops a terminal block fixed on the cables, the correct amount of slack is left for proper separation of the cables by the retractor.

3,593,614
CHUCK DEVICE FOR RELEASABLY ATTACHING A MILLING CUTTER TO A MACHINE TOOL SPINDLE
Maso Galbarini, Pavia, and Francesco Cotta Ramusino, Milan, both of, Italy, assignors to Innocenti Societa General Per L'Industria Metallurgica E Meccanica, Milan, Italy
Filed Apr. 29, 1969, Ser. No. 820,162
Claims priority, application Italy, May 24, 1968, 51784-A/68
Int. Cl. B23c *1/00;* **B23b** *31/16*
U.S. Cl. 90—11 A **6 Claims**



This invention provides a chuck device for releasably attaching a milling cutter to a machine tool such as a large size milling-boring machine having an inner spindle slidable coaxially within a hollow outer spindle. The chuck device has a head which is attachable to the outer spindle of the machine tool and a plurality of clamping jaws mounted in the head for radial sliding movement under the action of cam means in response to axial movement of the inner spindle. Each jaw has a radially inwardly projecting portion which clamps, preferably by a jamming action, a cutter assembly to the head, rotation of the cutter assembly relative to the head being prevented. Preferably a compressed air stream is directed over the mating surfaces of the cutter assembly and the head from internal passages in the head for cleaning purposes.

3,593,615
MECHANISM FOR TRANSFERRING DIMENSIONAL AND SHAPE INFORMATION BETWEEN TWO AND THREE DIMENSIONAL OBJECTS
James D. Shelton, Bothell, Wash., assignor to Ralph W. Krutsinger, Jr., a part interest
Filed Nov. 12, 1969, Ser. No. 875,706
Int. Cl. B23c *1/16;* **B43l** *13/10*
U.S. Cl. 90—13.1 **12 Claims**



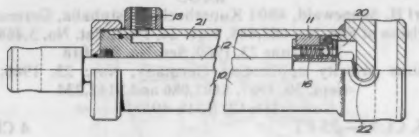
A system of master-slave synchro-servomechanism interconnectes, for conjoint movement, a fist stylus mounted for two dimensional movement across a paper or other flat surface, and a second stylus mounted for a corresponding two dimensional movement over a three dimensional object. The second stylus is adjustable in the third dimension, and both styluses may be rotatable and interconnected by master-slave synchro-servomechanisms adapting them for conjoint rotation. The synchro-servomechanisms are reversible so that each stylus can control the other.

3,593,616

HYDRAULIC SAFETY OR OVERLOAD RELEASE MECHANISM

John Vaudrey Fox, Evesham, England, assignor to Bomford & Evershed Limited, Evesham, England

Filed June 16, 1969, Ser. No. 833,553
Claims priority, application Great Britain, June 17, 1968, 28,793/68
Int. Cl. F01l *21/04*; F15b *15/17*
U.S. Cl. 91—228 4 Claims



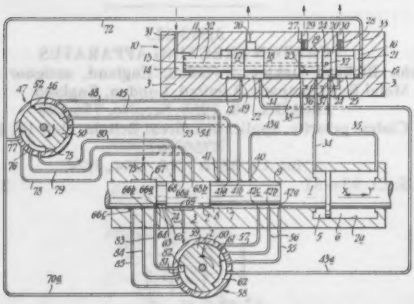
A hydraulic ram for use as a safety or overload device comprises a cylinder closed at one end, a piston within and movable along the cylinder with a piston rod projecting through a fluid seal or gland at the other end thereof, an inlet for pressure fluid into the gland end of the cylinder, a passageway for fluid connecting the two ends of the cylinder, a nonreturn valve in said passageway permitting substantially free flow from the gland end to the closed end and a pressure relief valve arranged to permit flow of fluid out of the closed end when the pressure in the closed end exceeds a predetermined value or a predetermined value above that in the gland end.

3,593,617

FLUID PRESSURE OPERATED MOTORS

Philip Butterworth, Bramhall, England, assignor to Butterworth Hydraulic Developments Limited

Filed Jan. 28, 1969, Ser. No. 794,745
Claims priority, application Great Britain, Feb. 12, 1968, 6,797/68
Int. Cl. F01l *25/06*
U.S. Cl. 91—239 15 Claims



This invention relates to fluid pressure operated motors and in particular to such motors of the type in which a piston is mounted to exhibit axial movement in a piston cylinder and in which movement of the piston is controlled by the exhaust of liquid pressure or gas pressure from a chamber associated therewith.

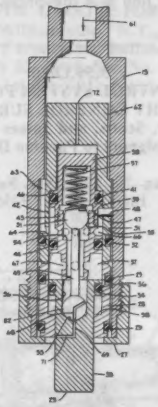
3,593,618

BELLRINGER

Charles J. Eberle, R.R. 15, Box 148, Lafayette, Ind.

Filed June 5, 1969, Ser. No. 830,781
Int. Cl. F01l *15/16*, *31/02*
U.S. Cl. 91—273 8 Claims

A two-piece housing received in a stem receives a ported valve body with first valve seat therein, and a plunger with second valve seat therein. A spring-loaded valve member has two spheres thereon for closing one or the other seat for the power and return strokes of the plunger, with appropriate porting for plunger force and timing control.

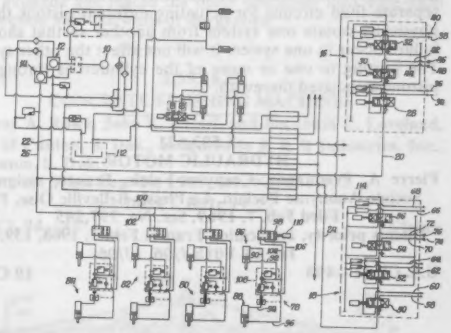


3,593,619

HYDRAULIC CONTROL CIRCUIT

Allan J. Albrecht, Rothschild, Wis., assignor to J. I. Case Company

Filed Mar. 4, 1970, Ser. No. 16,487
Int. Cl. F15b *11/16*
U.S. Cl. 91—411 R 8 Claims



A hydraulic control circuit is disclosed herein that has particular utility with a self-propelled construction equipment-type of vehicle, such as a crane or an excavator, e.g., a backhoe. The circuit includes a first pump means for providing pressurized fluid for actuating at least one fluid motor in the circuit in one direction, and a second pump means for providing pressurized fluid for actuating at least one fluid motor in the circuit in one direction, and a second pump means for providing pressurized fluid for operating the fluid motor in an opposite direction. A first control valve means is associated with the first pump means and a second control valve means is associated with the second pump means, with each control valve means having a blocked position for preventing flow of fluid therethrough and at least one open position permitting fluid to flow therethrough. The control valve means are alternatively positionable in the blocked position, and the conduit means of the circuit are arranged such that when the first control valve means is in the blocked position and the second control valve means is in the open position, one line to the fluid motor means is pressurized for operating the fluid motor means in one direction, while

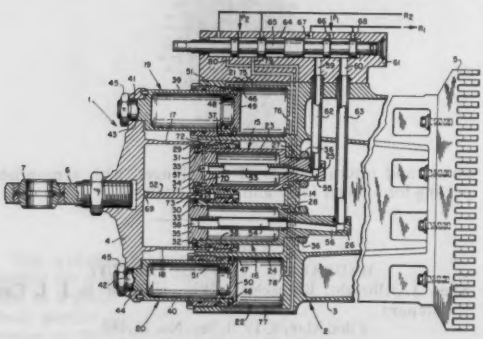
another line connected to the fluid motor means is a low pressure line open to tank. When the first control means is in the open position and the second control means is in the blocked position, the last-mentioned line is pressurized for moving the fluid motor means in an opposite direction, while the first-mentioned line is a low-pressure line connected to tank.

3,593,620

REDUNDANT CONTROL SYSTEM FOR ACTUATION OF FLIGHT CONTROL SURFACES

Dave John Foerster, Scotts, and James S. Mason, Marcellus, both of, Mich., assignors to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed Aug. 20, 1969, Ser. No. 851,602
Int. Cl. F15b *13/06*
U.S. Cl. 91—413 **16 Claims**



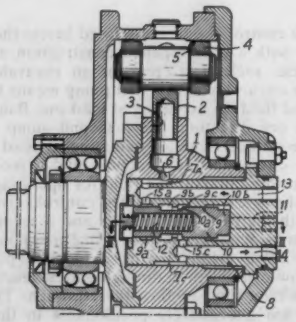
A redundant control system including a two-part housing, each part containing one or more output pistons extending into associated cylinders in the other part and two or more separate fluid circuits for actuating different pistons thus to physically isolate one system from another so that should a failure occur in one system it will not affect the other system. The porting to one or more of the cylinders is through the pistons associated therewith.

3,593,621

HYDRAULIC MOTOR

Pierre A. Praddaude, Crepy-en-Valois, France, assignor to Societe Anonyme Poclain, Le Plessis-Belleville Oise, France

Filed Feb. 7, 1969, Ser. No. 797,595
Claims priority, application France, Feb. 7, 1968, 139,018
Int. Cl. F01b *1/06, 13/06*
U.S. Cl. 91—498 **10 Claims**



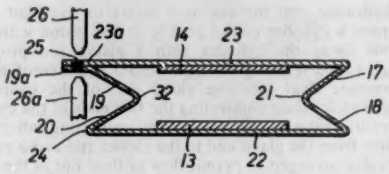
In a fluid motor comprising a rotary cylinder block, a plurality of pistons mounted in cylinders in the block and a distributor mounted in the cylinder block for controlling the flow of pressure fluid for operating the pistons, the distributor has at least three groups of fluid distributing ports, one group being connected permanently to either the main fluid supply conduit or the main fluid discharge conduit, and means are provided for connecting at least one of the other two groups selectively to one or the other of the said main fluid conduits so that all the pistons in the cylinder block operate continually at all speeds of the motor.

3,593,622

METHOD OF MANUFACTURING PLASTIC CARRIER BAGS

Karl H. Sengewald, 4801 Kunsebeck, Westphalia, Germany

Division of Ser. No. 685,668, Nov. 24, 1967, Pat. No. 3,468,470.
Filed June 23, 1969, Ser. No. 871,018
Claims priority application Germany, Nov. 23, 1966, and Sept. 30, 1967, S107,086 and S112,234
Int. Cl. B31b *49/04*
U.S. Cl. 93—35 PT **4 Claims**



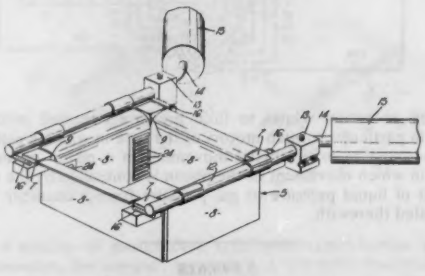
A method of forming a carrier bag made of synthetic thermoplastic material wherein a printed flat sheet of plastic has two reinforcing strips attached thereto and uniformly spaced relative to the median longitudinal axis of the sheet. The sheet is then bent about the longitudinal median axis to form a hose longitudinally open at one side so that the reinforcing strips are opposite one another. Lateral folds are formed in the hose to form two collapsible sidewalls and two reinforced sidewalls, and a longitudinal weld seam is made to longitudinally close the hose. Furthermore, a bottom weld seam transverse to the longitudinal weld seam is made and the so formed bag is separated from the strip and a grip aperture is formed in the upper portion of the bag. It is also possible to have the upper portion contoured simultaneously with the forming of the grip aperture.

3,593,623

CARTON ERECTING APPARATUS

John Richard Oakley, Swindon, England, assignor to The Metal Box Company, Limited, London, England

Filed Oct. 10, 1968, Ser. No. 776,299
Claims priority, application Great Britain, Oct. 19, 1967, 47693/67
Int. Cl. B31b *1/46, 1/64, 3/74*
U.S. Cl. 93—51 **3 Claims**



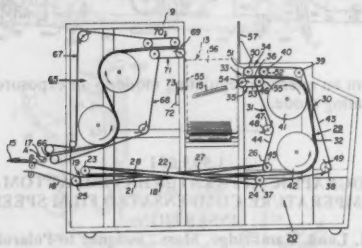
Carton erecting apparatus comprises a forming die and a reciprocable punch arranged to press a carton blank into the die and hollow members connectable with a source of heated air are supported adjacent to the mouth of the die and are arranged, before a blank resting thereon is pressed into the die, to direct heated air on to those areas of the opposite sides of

the blank which are to be sealed one to the other when the blank is pressed into the die by the punch.

3,593,624
AUTOMATIC STACKING MACHINE

Robert V. Dufour, 10615 St. Denis, Montreal 357, Quebec, Canada

Filed Apr. 4, 1969, Ser. No. 813,658
Claims priority, application Canada, Feb. 28, 1969, 044,256
Int. Cl. B65h *33/00*
U.S. Cl. 93—93 22 Claims

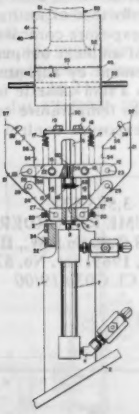


A machine for stacking newspapers and the like articles in which the incoming articles are counted and a predetermined number diverted to a first and to a second conveyor for ejecting the articles in a stacking bucket from opposite sides thereof. The articles are conveyed more rapidly on one of the conveyors to be stacked in a predetermined manner in the bucket and to permit unloading of the stack without stopping the incoming articles on the conveyors.

3,593,625
BOTTOM PRE-BREAKING MECHANISM FOR A CARTON FORMING MACHINE

Howard R. Garrett, St. Paul, and Percy King, Bloomington, both of, Minn., assignors to Haskon, Inc., St. Paul, Minn.

Filed Nov. 22, 1968, Ser. No. 778,135
Int. Cl. B31b *1/52, 45/00;* B31f *1/08*
U.S. Cl. 93—84 TW 4 Claims

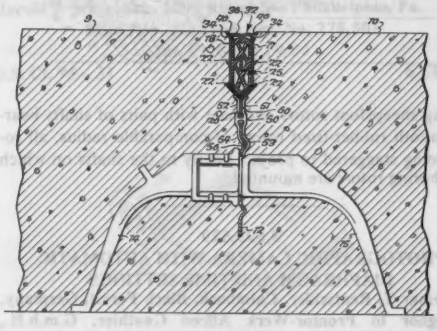


This invention relates to a machine for erecting paper cartons from flat blanks and particularly to the mechanism for prebreaking the bottom panels of the carton in a machine for erecting two different cross-sectional sizes of cartons and consists of a pair of fingers that are pivotally mounted for movement of their working ends inwardly against the infolding panels of the carton, which fingers have a cam face that extends from a point outwardly of the sidewalls of the small size carton but inwardly of the sidewalls of the large size cartons to a point that is outwardly of the sidewalls of the large size cartons.

3,593,626
PLASTIC GROOVE FORMER

Alfred F. Crone, Williamsville, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed July 22, 1968, Ser. No. 746,689
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 5 Claims

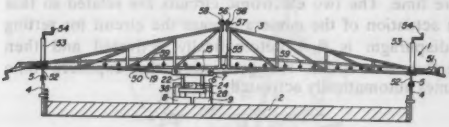


This application discloses a groove former and seal which includes an outer container within which an inner expandible compressor or seal is confined so that when the container is closed with the seal inside of it, it can be used to form a groove in the highway while the paving material is in its wet or plastic condition, and after the paving material has become hardened or set, the container is released from the position in which it compresses the inner seal so that this seal then expands and forces the outer container into watertight connection with the walls of the groove.

3,593,627
CONCRETE FINISHING MACHINES

Murray A. Rowe; John E. Kessel, and Burnham C. Loveland, all of Canton, S. Dak., assignors to K & R Industries, Inc., Canton, S. Dak.

Filed Aug. 26, 1969, Ser. No. 853,177
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 3 Claims



A concrete finishing machine movable longitudinally of a road and having a pair of oppositely reciprocating finishing members movable transversely back and forth across the road.

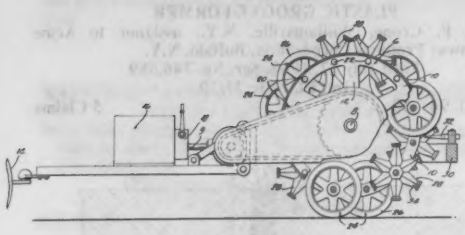
3,593,628
COMPACTING DEVICE

William C. Lathers, 4337 Britta Parkway, Madison, Wis.

Continuation-in-part of application Ser. No. 617,524, Feb. 21, 1967, now Patent No. 3,446,123, dated May 27, 1969. This application May 16, 1969, Ser. No. 825,321
Int. Cl. E01c *19/26*
U.S. Cl. 94—50 4 Claims

A frame has a primary shaft upon which a skeletonized cylinder is rotatable either idly by ground contact, or by

power. The cylinder comprises axially spaced spoke supported discs carrying secondary shafts in annular series for orbital movement about the cylinder axis. Pairs of shafts



bearing sheepsfoot rotors alternate with pairs of shafts bearing smooth rubber-tired rotors of comparable radius, all rotors being staggered to project nearly to the shafts on which neighboring rotors are mounted.

3,593,629

PHOTOGRAPHIC CAMERA WITH AUTOMATIC DIAPHRAGM AND TIME SETTINGS

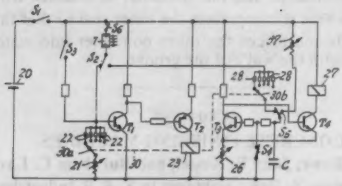
Waldemar T. Rentschler, Calmbach, Black Forest, Germany, assignor to Prontor-Werk Alfred Gauthier, G.m.b.H., Calmbach, Black Forest, Germany

Filed Dec. 23, 1965, Ser. No. 523,495

Claims priority, application Germany, Dec. 28, 1964, G 42395

Int. Cl. G03b *7/08, 9/62*

U.S. Cl. 95—10 **15 Claims**



A photographic camera is provided with automatic light control settings for diaphragm and exposure time. One electronic circuit is provided for setting the diaphragm and another electronic circuit is provided for generating the exposure time. The two electronic circuits are related so that upon actuation of the camera release the circuit for setting the diaphragm is first automatically activated and then thereafter the circuit for generating the exposure time becomes automatically activated.

3,593,630

BRAKING AND SEQUENCING MECHANISM

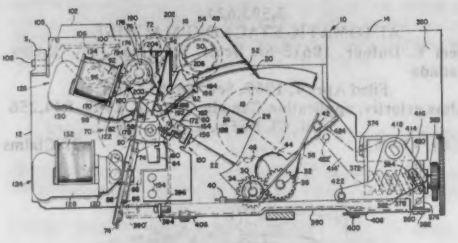
Lawrence M. Douglas, Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 784,064, Dec. 16, 1968. This application June 30, 1969, Ser. No. 837,510

Int. Cl. G03b *7/08, 9/06, 9/60*

U.S. Cl. 95—10 **25 Claims**

A mechanism for an exposure control system operative to sequentially control effective aperture and exposure interval. The mechanism features an actuator component which is operative to perform exposure mode sequencing in addition to actuating an aperture diaphragm brake. The actuator component is configured to operate codirectionally with the actuating portion of the brake assembly. This codirectional operation permits a high and repeatable responsiveness necessary to proper operation of the exposure control system. The actuator component also is operative to actuate any necessary switching of the control system when it is altered from an aperture regulating mode to an exposure interval regulating mode.



3,593,631

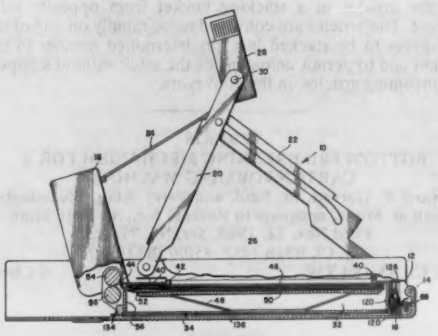
PHOTOGRAPHIC APPARATUS HAVING AUTOMATIC TEMPERATURE COMPENSATED FILM SPEED INSERTION

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 19, 1969, Ser. No. 878,086

Int. Cl. G03b *7/08, 7/22*

U.S. Cl. 95—10 **17 Claims**



Photographic apparatus in which film is exposed and then processed as an adjunct to that exposure. Exposure is performed by an automatic exposure control system which compensates for deviations of ambient temperature from an optimum value for development by adjusting exposure values. A thermistor attached to a film cassette is used for inserting film speed data as well as temperature responsive exposure compensation into the exposure control system of the apparatus.

3,593,632

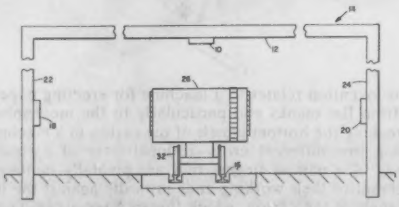
VOLUME RECORDER

Bobby S. Woodruff, 2308 Gallatin S.W., Huntsville, Ala.

Filed May 2, 1969, Ser. No. 821,278

Int. Cl. G03b *19/00*

U.S. Cl. 95—11 **4 Claims**



An automatic pulpwood recorder for measuring the volume of pulpwood loaded on a railroad car in which

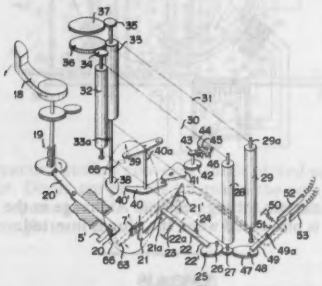
cameras are placed over and on each side of a railroad track and by means of car-position sensing switches the cameras are operated each time a car is centered with respect to the cameras.

3,593,633

STROBO-FLASH PHOTOGRAPHING DEVICE

Jun Shimomura, and Tomio Tsuruoka, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed July 18, 1968, Ser. No. 745,849
Claims priority, application Japan, July 31, 1967, 42/48846
Int. Cl. G03b 9/70
U.S. Cl. 95—11.5 9 Claims



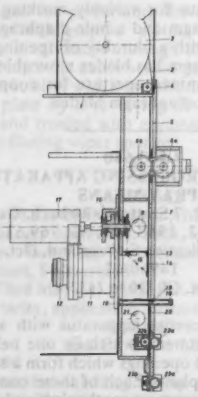
An electronic flash photographing device for a camera having a focal plane shutter and interchangeable objective lenses each having a lens shutter. A signal member on the camera body transmits a signal to the lens shutter, upon completion of the opening operation of the first curtain of the focal plane shutter. The lens shutter is in the closed position immediately before receiving the signal from the signal member and opens in response to the signal resulting in closure of the X contacts to energize the electronic flash. The lens shutter and the second curtain of the focal plane shutter are arranged to close after the flash.

3,593,634

APPARATUS FOR MAKING A LARGE-FORMAT PHOTOGRAPH OR A NUMBER OF SMALL-FORMAT PHOTOGRAPHS WITH THE SAME TOTAL SURFACE AREA

Emil Guntersweiler, Zurich, Switzerland, assignor to Elektro-Watt, Elektrische, Und Industrielle Unternehmungen A.G., Zurich, Switzerland

Filed Dec. 11, 1968, Ser. No. 782,827
Claims priority, application Switzerland, Dec. 22, 1967, 18,217/67
Int. Cl. G03b 19/00
U.S. Cl. 95—18 4 Claims



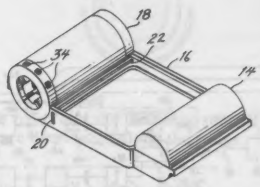
The present invention relates to the optional production either of a large-format photograph or of a number of small-format photographs with the same total surface area and the apparatus therefor. An object to be photographed is used to produce optionally either a large-format picture by way of a plain light deflection element and a lens of long focal length or a number of smaller picture in a single take by way of at least two light deflection elements arranged at an angle to one another and a lens of short focal length. The two lenses and the light deflection elements thereby are pivoted selectively in front of a photographic device.

3,593,635

FILM CARTRIDGE

Harold J. Servetnick, 1002 Ripley St., Philadelphia, Pa.

Filed Nov. 25, 1968, Ser. No. 778,501
Int. Cl. G03b 19/04
U.S. Cl. 95—31 6 Claims



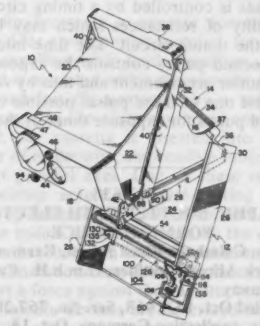
A photographic film cartridge for insertion into a camera contains supply and takeup reel housings. A structurally weak area is provided adjacent the takeup reel housing. After the film has been exposed, the takeup reel housing may be separated from the remainder of the cartridge in order to permit more convenient handling and shipping of the exposed film.

3,593,636

CAMERA LOADING DOOR AND RELEASE MEANS THEREFOR

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 13, 1969, Ser. No. 824,098
Int. Cl. G03b 17/04, 17/52, 17/00
U.S. Cl. 95—39 9 Claims



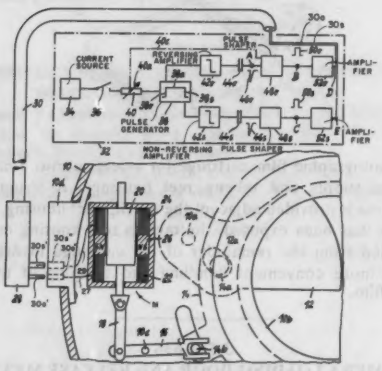
A compact folding camera including a housing having a plurality of sections, one of which includes a reflector. The sections are coupled to each other for movement between extended and folded positions and at least a portion of one of the housing sections is movable to an open position to permit loading of film into the camera. In the folded position of the camera, the reflector is located close to means for supporting the film so as to be readily accessible and subject to damage when the section is opened for loading. A release is provided which can only be actuated to open the section for loading

when the housing sections are not in the folded position, thereby insuring that the reflector is spaced from the support means.

3,593,637
PHOTOGRAPHIC CAMERA INCLUDING PULSE CONTROLLED SHUTTER

Paul Fahlenberg, Lindenstrasse 16a, Baierbrunn, and Wilhelm Pross, Einbracht-Strasse 6a/11, Munich, 9, both of, Germany

Filed June 5, 1968, Ser. No. 734,628
Claims priority, application Germany, June 14, 1967, C 42 619
Int. Cl. G03b 9/62
U.S. Cl. 95—53 **8 Claims**



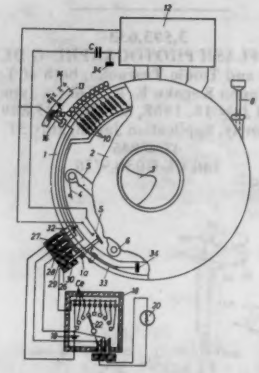
A photographic camera includes a shutter arrangement wherein the shutter blades are moved between open and closed positions in response to first and second timing pulses produced by a detachable electronic device. The duration of the timing pulses is controlled by a timing circuit which includes a plurality of resistances which may be selectively switched into the timing circuit. The time interval between the first and second pulses controls the exposure time provided by the shutter arrangement and thus by varying the duration of at least one of these pulses possible overlap of the first and second pulses for exposure times of short duration is avoided.

3,593,638
PHOTOGRAPHIC SHUTTER WITH ELECTONIC TIME FORMING DEVICE

Dieter Rittman, Calmbach Black Forest, Germany, assignor to Prontor-Werk Alfred Gauthier, G.m.b.H., Calmbach Black Forest, Germany

Filed Oct. 14, 1968, Ser. No. 767,282
Claims priority, application Germany, Oct. 18, 1967, P 15 97 363.4
Int. Cl. G03b 9/58
U.S. Cl. 95—53 **3 Claims**

A photographic shutter is provided having an electronic timing circuit means for the exposure time and a setter connected to it for setting the exposure time. Control means are connectable to the electronic timing circuit means to provide for additional exposure times or exposure time dependent on ambient lighting conditions. The control means is connectable to the circuit means by a plug when a setter has been adjusted to a certain setting position. Advantageously the shutter and the plug have interengaging portions permitting insertion of the plug only after the previous movement of the

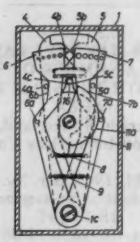


setter to the certain setting position. A change in the position of the setter is prevented when the plug is inserted.

3,593,639
APPARATUS FOR VARIABLY MASKING A PHOTOELECTRIC CELL IN A PHOTOGRAPHIC APPARATUS

Franz W. R. Starp, Black Forest, Germany, assignor to Prontor-Werk Alfred Gauthier, G.m.b.H., Calmbach, Black Forest, Germany

Filed Aug. 26, 1968, Ser. No. 755,134
Claims priority, application Germany, Aug. 25, 1967, P 15 72 806.0
Int. Cl. G03b 9/02
U.S. Cl. 95—64 **14 Claims**



Photographic apparatus for variably masking a photocell including an iris diaphragm and a hole diaphragm. The hole diaphragm has blades with a plurality of openings varying in size, and the iris diaphragm has blades moveable in a closing direction to a predetermined aperture for cooperating with the openings of the hole diaphragm blades.

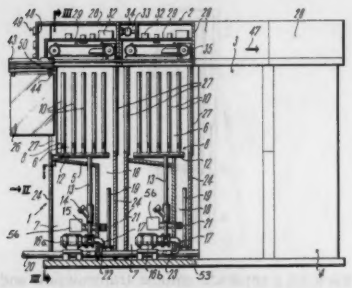
3,593,640
PHOTOGRAPHIC PROCESSING APPARATUS WITH SPRAY MEANS

Kurt Gall, Welfenstr. 22, 7 Stuttgart-Birkach, Germany

Filed Oct. 22, 1968, Ser. No. 769,613
Claims priority, application Switzerland, Oct. 24, 1967, 14960/67
Int. Cl. G03c 11/72
U.S. Cl. 95—89 **19 Claims**

A photographic processing apparatus with a plurality of film-processing compartments which lie one behind another and have aligned lateral openings which form a straight transport path in a vertical plane. Each of these compartments is provided with its own transport mechanism and spray device. This spray device has two banks of nozzles which spray film-

processing liquids on the film or plate suspended by the transport mechanism; the latter consists of a bar to which the film is clamped and which is pulled along a horizontal guide

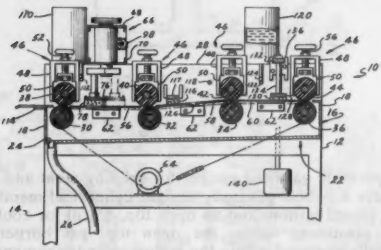


by a respective endless conveyor and is picked up by the next conveyor. Doors are provided between the compartments to prevent passage of film-processing liquids or light therethrough.

3,593,641
APPARATUS FOR DEVELOPING PHOTOLITHOGRAPHIC PLATES

Paul Adams, and Ferdinand Lukasik, both of South Hadley, Mass., assignors to John Stark Laboratories, Inc., Holyoke, Mass.

Filed Nov. 1, 1968, Ser. No. 772,543
Int. Cl. G03d *3/00*
U.S. Cl. 95—89 **9 Claims**



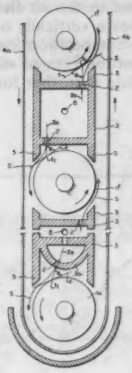
An apparatus for performing the developing sequence on exposed photolithographic plates wherein a photolithographic plate is advanced through the apparatus by a series of drive and nip rolls and wherein the plate is treated with a developing emulsion which is uniformly spread over the surface of the plate by a revolving developer bar, rinsed in a water wash and treated with a gumming solution by the action of an oscillating wiper sponge.

3,593,642
STRIP HANDLING APPARATUS

Joseph Becheiraz, Marly Le Petit, and Ulrich Frauchiger, Winterthur, both of, Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed May 14, 1968, Ser. No. 729,058
Claims priority, application Switzerland, May 16, 1967, 6,901/67
Int. Cl. G03d *3/12*
U.S. Cl. 95—94 **6 Claims**

An apparatus for handling a strip of material such as for film processing. The apparatus has at least one rotatable roller below the level of a liquid in a tank and over which the strip of material is to be passed. Means are provided for directing into the wedge-shaped opening formed between the

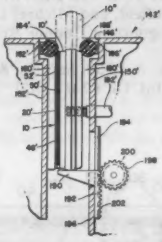


surface of the roller and the incoming strip of material jets of liquid which are distributed along the roller.

3,593,643
APPARATUS FOR RUPTURING A PROCESSING FLUID CONTAINING POD IN A PHOTOGRAPHIC CASSETTE

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 3, 1969, Ser. No. 838,794
Int. Cl. G03d *5/02*
U.S. Cl. 95—89 **8 Claims**



Apparatus for receiving a cassette containing a pod of processing fluid for photographic material, for rupturing such pod and for expelling such fluid therefrom. Typically, the fluid filled pod is mounted within the cassette adjacent a support surface and initially protected by a removable cover plate. After removing the aforementioned cover plate to expose the pod, the cassette is inserted into the apparatus between a pair of resiliently compressible rollers mounted for rotation about parallel axes. One of these rollers exerts a force progressively across the pod during the insertion process whereby the pod is ruptured and the fluid expelled therefrom. The rollers are compressed by the cassette as the cassette passes therebetween and expand over an end of the cassette when the cassette has been fully inserted into the apparatus to exert a force against the cassette tending to lock it in position. Alternate devices are described for ejecting the cassette from the apparatus against the locking force of the rollers.

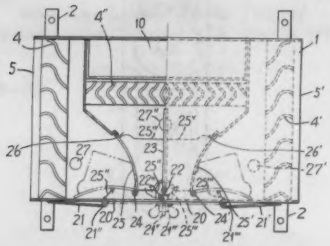
3,593,644
RAILROAD CAR VENTILATOR

Toraichi Shinya, 9-34, Koshein Nibancho, Nishinomiya, Japan

Filed Apr. 21, 1969, Ser. No. 817,800
Int. Cl. B60l ; F23l *17/04*
U.S. Cl. 98—8 **7 Claims**

A railroad car ventilator comprises a housing body for mounting on the roof of a railroad car and a vertically

oriented conduit connecting the interior of the housing body to the interior of the railroad car. The housing body is is formed with air flow passage means connecting the conduit to the railroad car exterior. A plurality of moisture draining elements are positioned in the air flow passage means, and each element comprises a vertically oriented plate of corrosion-resistant plastic composition material, and having a horizontally arched portion formed with vertically extending corrugations. Each plate is further formed with horizontally



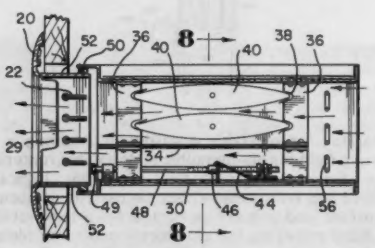
oriented stepped flanges at the upper and lower ends of the arched portion, whereby the elements may be readily arranged in stacked relation. A hinged shutter plate controls communication between the interior and the exterior of the railroad car through the ventilator, and is spring biased to either a stable closed position or a stable opening position. The ventilator may be used either as an air inlet or an air exhaust ventilator, suitable damper plates or the like being provided for converting the operation from air supply to air exhaust.

3,593,645

TERMINAL OUTLET FOR AIR DISTRIBUTION SYSTEM

Thomas L. Day, Brookfield, and Michael L. Krisko, Danbury, both of, Conn., assignors to Connor Engineering Corporation, Danbury, Conn.

Filed Mar. 3, 1969, Ser. No. 803,761
Int. Cl. F24f *13/00*
U.S. Cl. 98—40 VM **2 Claims**



This disclosure is directed to a controlled volume air terminal outlet for use at a room discharge of an air distribution system for a building. The terminal outlet includes a first damper section which is thermostatically controlled for throttling air passing therethrough and a second damper section which is manually or otherwise controlled. Discharge through the terminal outlets passes through a diffuser for air pattern control. A pressure and temperature branch control is also disclosed.

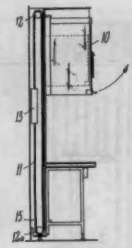
3,593,646

MOVABLE-APRON HOOD, NOTABLY FOR LABORATORIES

Francois Hauville, Paris, France, assignor to Teclab, Rueil-Malmaison, France

Filed June 4, 1969, Ser. No. 830,372
Int. Cl. F23J *11/00*
U.S. Cl. 98—115 **17 Claims**

A hood, notably of the type adapted to be associated with the working surface of a laboratory table for protecting the operators against the deleterious fumes developed, and the gaseous noxious products handled, during manipulations carried out on said surface, which comprises a movable apron suspended at its upper and rear portion from two points



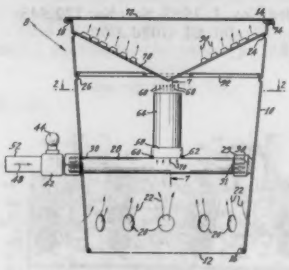
located each on a separate endless transmission and support line passing over rotary driving and guide members, each transmission and support line being provided with a balance counterweight, said line and members being part of the apron hoisting system.

3,593,647

BROILER

Walter C. Copeland, Jr., Madison, Fla.

Filed Jan. 2, 1969, Ser. No. 788,369
Int. Cl. A47j *37/06*
U.S. Cl. 99—259 **5 Claims**



A portable gas-fired cooker for broiling meat and the like includes a hollow generally upright cylindrical member having a closed bottom and an open top, a grill for cooking the meat positioned across the open top, gas burner means generally centered within the hollow cylindrical member and positioned spacedly downwardly from the open top, and an inverted conical plate extending across the cylindrical member and positioned between the gas burner means and the grill. The plate has an imperforate center portion and a perforated outer portion to permit flames to extend upward through the perforated outer portion to cook the meat by direct flame heat. Additionally, the plate is adapted and arranged to catch and collect drippings and juices emitted from the cooking meat permitting the burner means to burn the collected drippings and juices on the plate whereby smoke therefrom rises upward to engulf the cooking meat and impart a savory charcoal flavor to the same.

3,593,648

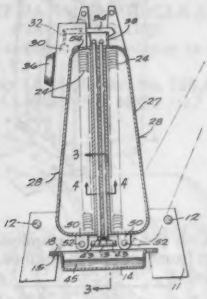
COOKING APPLIANCE

Roy J. Walters, 2462 Worden St., San Diego, Calif.

Filed June 25, 1968, Ser. No. 739,681
Int. Cl. A47j *27/62*
U.S. Cl. 99—332 **6 Claims**

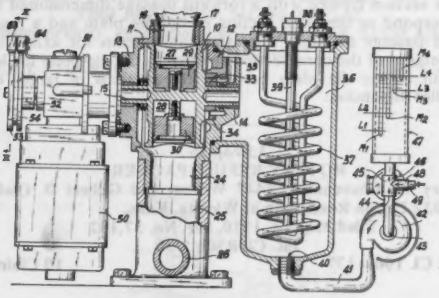
A cooking appliance comprising a base stand having a pair of electrical heating units pivotally mounted thereon in a substantially upright position. The heating units are pivotally mounted along the lower edges thereof and are adapted to be opened and closed in a manner similar to a woman's purse. A

portable food supporting rack is removably positioned in an upright position between the heating units and a drip pan is removably mounted beneath the rack. With the rack positioned between the heating units the units are pivoted to



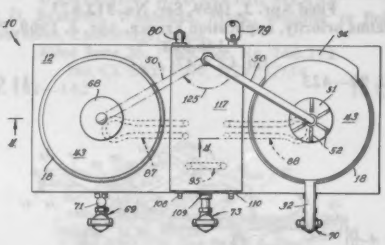
close position bringing the food (such as bacon) on the rack in close contact with the heating units. The heating units are locked in closed position by a timer controlled latch mechanism adapted to release the units for movement to open position after a preset time interval.

3,593,649
COFFEE-MAKING APPARATUS
Andrea Ivo Novi, 63, Corso Buenos Aires, and Mario Egi, 2, Via Carignano, both of Milan, Italy
Filed Nov. 27, 1968, Ser. No. 779,570
Claims priority, application Italy, Nov. 30, 1967, 23340-A/67
Int. Cl. A47j *31/00*
U.S. Cl. 99—289 **8 Claims**



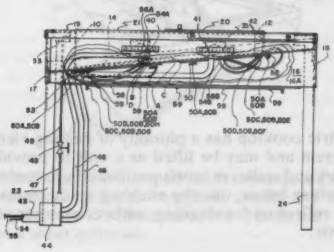
An automatic coffeemaking apparatus comprising a drum supported for rotation about an horizontal axis within a cylindrical chamber formed in a casing and having an upwardly turned fresh coffee inlet passage, a laterally turned screened beverage outlet passage and a downwardly turned exploited coffee exhaust and dispensing passage diametrally opposite to said inlet passage, the said passage defining a first and respectively a second and a third work station circumferentially spaced of 90° from each other. The said drum is formed with two diametrally located opposite coffeemaking cavities and adapted to be intermittently driven for successive 90° rotational steps, whereby either of said cavities is sequentially indexed at any of said stations, and the indexing of any cavity at said third station for exploited coffee exhaustion causing indexing of the other cavity at the first station, preparatory for a next cycle of operation.

3,593,650
URN-TYPE COFFEE BREWER
John C. Martin, and Eugene G. Rescho, both of Springfield, Ill., assignors to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Jan. 15, 1970, Ser. No. 3,013
Int. Cl. A47j *31/14*
U.S. Cl. 99—291 **14 Claims**



Urn-type coffee brewer has a tank having a cover from which a pair of coffee extract receptacles depend into hot water in the tank. Each receptacle has a downwardly stepped apertured plastic cover for receiving over a limited area a correspondingly stepped plastic funnel on which a ground coffee carrying filter is placed. The funnel is arranged for two hand manipulation. A plastic funnel cover overlies the funnel on one receptacle and a duplicate cover overlies the other receptacle. A spray head is detachably mounted underneath an apertured cup-shaped formation on the funnel cover and is supplied with hot water from the tank by an electric motor driven pump controlled by a timer which determines the length of the brewing cycle. Flow of water to the tank is controlled by a solenoid valve in accordance with the water level in the tank at a rate that is less than the rate of outflow of hot water to the spray head. L-shaped thermostatically controlled electric heating elements maintain the water in the tank at a predetermined temperature. A continuously energized heater in the tank compensates for heat loss therefrom. A replaceable panel has mounted thereon the motor driven pump and timer therefor, the valve and its water level control, the heating elements and thermostat controls, and the continuously energized heater.

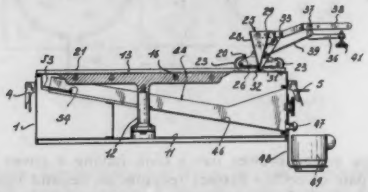
3,593,651
COMBINATION COOKER, FRYER AND BUN WARMER ELECTRICAL APPLIANCE
Helen E. McEvoy, 1416 W. Douglas Ave., Wichita, Kans.
Filed July 11, 1969, Ser. No. 840,904
Int. Cl. A47j *27/18*
U.S. Cl. 99—339 **5 Claims**



Electrical food preparation apparatus comprising an open-topped cooking container recessed in the top of a housing with free airspace within the housing below and about the sides of the container. The container has a sloping bottom and independent thermostatically controlled electric heaters are disposed below the relatively upper and lower portions so as to heat controllably such respective portions and to heat the airspace for heat transfer to the top of the housing. Valve-controlled means are provided for introducing water

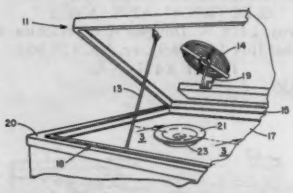
into the container, and means are provided for reducing heat transfer to portions of the housing as well as means for protecting the user against inadvertent contact with the housing.

3,593,652
GRIDDLE
Auguste Lostanlen, 46, Rue Auguste Buisson, 92 La Garenne, Columbes, France
Filed Apr. 2, 1969, Ser. No. 812,673
Claims priority, application France, Apr. 3, 1968, PV 146,868
Int. Cl. A47j 37/10
U.S. Cl. 99—423 11 Claims



A griddle particularly suited for the making of pancakes, the apparatus being characterized by a horizontal cooking surface and a movable batter dispensing mechanism disposed above the cooking surface. The batter dispensing mechanism comprises a trolley which includes a normally closed funnel extending across the cooking surface, the mouth of the funnel being capable of being opened to dispense batter on the cooking surface as the trolley is passed thereover.

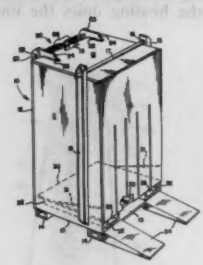
3,593,653
ELECTRIC COOKTOP WITH A REMOVABLE SPILLOVER DEVICE
Christian E. Buerki, Fullerton, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.
Filed May 1, 1970, Ser. No. 33,683
Int. Cl. H05b 3/76
U.S. Cl. 99—446 4 Claims



An electric cooktop has a plurality of heating elements installed therein and may be lifted as a unit to provide access to reflectors and spillover bowls positioned unattachedly on a support surface below, thereby enabling ready removal of the bowls and reflectors for cleaning, without removing the heating elements.

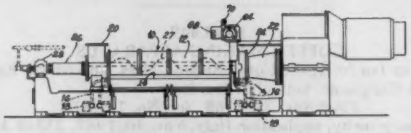
3,593,654
PORTABLE TRASH BALER
Ray D. Mayfield, 8424 S.W. 30th Ave., Portland, Oreg.
Filed Nov. 21, 1969, Ser. No. 878,644
Int. Cl. B65b 13/20
U.S. Cl. 100—34 8 Claims

A boxlike structure having a plate movable therein by the forks of a lift truck to compact trash confined in the structure. Ramps receive the front wheels of the lift truck to enable the weight of the truck to retain the structure in place during trash compaction. Also engageable with lift truck



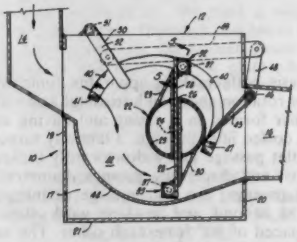
forks are means on the structures underside to enable convenient transport from one site to another.

3,593,655
MEANS FOR EXTRACTING WATER FROM ELASTOMERIC MATERIALS
Elmer E. Prescott, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.
Filed Jan. 31, 1969, Ser. No. 795,664
Int. Cl. B30b 3/02
U.S. Cl. 100—148 3 Claims



A device for squeezing excess water from prepared elastomeric polymeric materials by a device corresponding to a French Oil Mill having an exit opening in the form of a cone section formed with a forward passage dimensioned to correspond to the cross section of the die plate and a rearward passage of larger dimension and means for axial displacement of the cone section relative to the die plate for location of the die plate between the sections of larger or smaller dimension.

3,593,656
ROTARY REFUSE PACKER
Henry W. Churchman, 2447 Wilson, and Gilbert D. Clair, 6032 Legion Road, both of Wichita, Kans.
Filed May 14, 1970, Ser. No. 37,102
Int. Cl. B30b 5/00
U.S. Cl. 100—177 10 Claims



The invention is a rotary press for compacting waste paper and trash into a removable storage container. It comprises a rotating drum carrying a sliding packing blade positioned within a housing with the blade sliding in the drum as it rotates to accommodate the narrowing compaction area. A

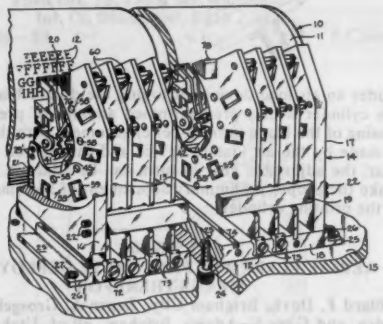
wiping blade coacts with the movement of the packing blade to sweep the compacted refuse into the storage container while the opposite end of the packing blade begins another compaction stroke.

3,593,657

COMBINED PRINT HAMMER MODULE AND PRINTED CIRCUIT BOARD

John Guzak, Jr., Waukegan, Ill., assignor to SCM Corporation, New York, N.Y.

Filed May 13, 1968, Ser. No. 728,606
Int. Cl. B41j *9/10*; H05k *1/12*
U.S. Cl. 101—93 5 Claims



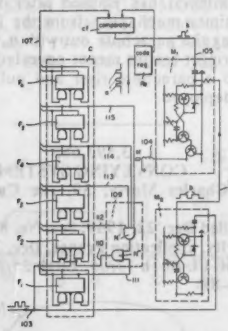
There is disclosed a fragmentary portion of a printer having print hammer modules, each module having a frame, print hammers, and print hammer operators, and a printed circuit board.

3,593,658

HIGH-SPEED PRINTING SYSTEM WITH CONTINUOUSLY ROTATING FONT WHEEL

Auro Artom, Turin, Italy, assignor to Cselt Centro Studi E Laboratori Telecomunicasioni S.p.S., Turin, Italy

Filed July 1, 1969, Ser. No. 840,132
Claims priority, application Italy, July 5, 1968, 52330 A/68
Int. Cl. B41j *5/46*
U.S. Cl. 101—93 C 5 Claims



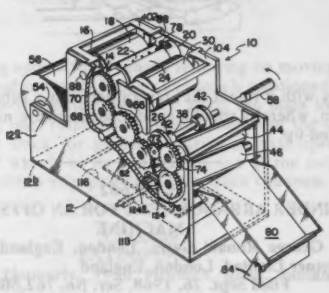
A teleprinter responsive to binary code combinations includes a continuously rotating font wheel with 51 peripherally equispaced typefaces and, synchronized with it, a reference wheel with 51 peripherally spaced alphanumerical markings respectively assigned to these typefaces and with 9 nonalphanumerical markings interspersed with the former. A sensor generates counting pulses in response to successive markings and steps a binary counter whose setting is fed to a comparator also receiving code combinations or "words" stored in a register in response to incoming message signals. Upon detecting a match, the comparator trips a striker successively confronted by the typefaces of the font wheel, operation of this striker being inhibited during periods in which counting pulses are generated by nonalphanumerical markings.

3,593,659

OFFSET PRINTING APPARATUS HAVING DISPOSABLE DAMPENING AND INKING MEANS

Robert D. Brackett, Wakefield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 26, 1968, Ser. No. 740,212
Int. Cl. B41f *7/04*, *7/24*, *31/34*
U.S. Cl. 101—142 18 Claims



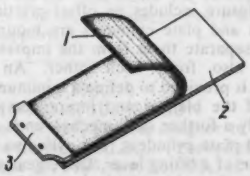
In an offset printing press, disposable dampening and inking materials, supplied in premoistened and preinked form, are supported in an unrestrained manner by dampening and inking cylinders, respectively, and disposed between them and the plate cylinder to provide controlled dampening and inking of the pressplate.

3,593,660

STENCIL PAPER AND ELECTRIC RECORDING AND METHOD OF PRODUCING THE SAME

Seizo Kineri, Tokyo; Yuzi Harasaki, Shizuoka, and Sadamitsu Sasaki, Toyohashi, all of, Japan, assignors to Tomoegawa Paper Manufacturing Company Limited, Tokyo, Japan and Nitto Electric Industrial Company Limited, Osaka, Japan

Continuation-in-part of application Ser. No. 333,171, Dec. 24, 1963, now abandoned. This application Sept. 5, 1967, Ser. No. 665,287
Claims priority, application Japan, Dec. 27, 1962, 37/59043
Int. Cl. B41n *1/24*
U.S. Cl. 101—128.2 3 Claims



An electrically sensitive stencil sheet is produced by blending a thermoplastic resin, an inorganic conductive fine particle powder and an electroconductive plasticizer which is shaped into a sheet material.

3,593,661

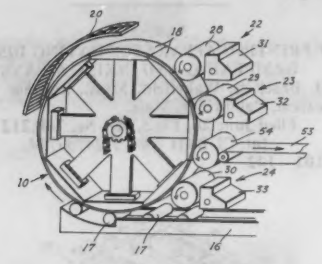
DRY INK-FILM PRINTING

Kenneth Franklin Tripp, Hancock, N.H., assignor to Markem Corporation, Keene, N.H.

Filed May 13, 1966, Ser. No. 549,854
Int. Cl. B41f *17/18*, *5/16*
U.S. Cl. 101—175 1 Claim

This invention relates to ink film transfer and particularly to printing on surfaces by offset and direct printing

techniques with an immediately dry image transfer of controlled thickness. When these techniques are employed in direct printing, the die or printing member is not inked directly with a fluent ink, but rather with a substantially dry ink-film, whereby small legend characters are not smothered or "filled-up."



3,593,662

CYLINDER ARRANGEMENT FOR AN OFFSET LITHO MACHINE

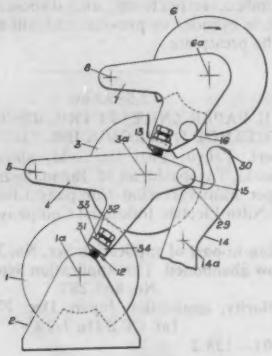
Albert George Ronald Gates, London, England, assignor to Gestetner Limited, London, England

Filed Sept. 26, 1968, Ser. No. 762,808

Claims priority, application Great Britain, Sept. 26, 1967, 43834/67

Int. Cl. B41f *7/04, 13/34*

U.S. Cl. 101—218 **9 Claims**



The disclosure includes an offset printing press in which the blanket and plate cylinders are mounted on swingable bearers to separate them from the impression cylinder and preferably also from each other. An adjustable stop mechanism is provided to define a minimum spacing between the axes of the blanket and impression cylinders and advantageously a further such mechanism is provided between blanket and plate cylinders. The cylinders may be separated by operation of a lifting lever. Drive gearing between two of the cylinders, desirably the blanket and impression cylinders, may include one of the two nonintermeshing gears attached to each cylinder, and a pair of intermeshing planetary pinions each meshing with a different one of the two gears.

3,593,663

DOCTOR BLADE ASSEMBLY FOR PRINTING EQUIPMENT

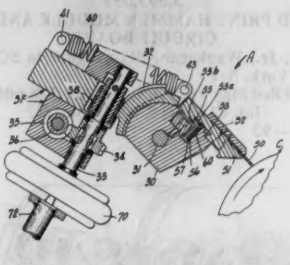
George Vischulis, Menomonee Falls, Wis., assignor to Zerand Corporation, New Berlin, Wis.

Filed June 3, 1969, Ser. No. 829,991

Int. Cl. B41f *9/10*

U.S. Cl. 101—350 **7 Claims**

An assembly for holding a doctor blade in adjustable position with respect to the printing cylinder. An air loaded clamping device locks the doctor blade firmly in operative position in its holder and when the doctor blade is to be removed, the air load can be relieved and the doctor blade and its mounting quickly and easily withdrawn in an endwise direction from the printing equipment without disturbing any of the other printing equipment. The adjustment also includes an air load device for urging the doctor blade against the cylinder with a predetermined amount of pressure; this biasing of the blade into proper engagement with the cylinder is made by the air loaded device and through an adjustable gear; the adjustable gear in turn, can be adjusted initially to make the proper preliminary adjustment of the blade relative to the printing cylinder.



3,593,664

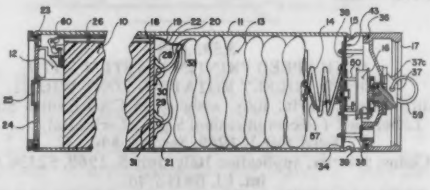
AERIAL FLARE AND PARACHUTE DEPLOYMENT MEANS THEREFOR

Willard F. Davis, Brigham City; Roger A. Grosgebauer, Ogden, and Gary V. Adams, Brigham, all of, Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Dec. 26, 1968, Ser. No. 787,079

Int. Cl. F42b *13/38, 25/04*

U.S. Cl. 102—35.6 **7 Claims**



An aerial illuminating flare is provided having a parachute deployed from the flare by a timer in cooperation with a detent mechanism and compressio n spring. When a predetermined time interval has elapsed after launch, the detent releases the timer mechanism from the flare case and it is ejected, pulling the parachute out with it. The flare becomes ignited by a trigger-igniter means operated by a lanyard from the trigger to a parachute riser and pulled thereby as the parachute is deployed.

3,593,665

CONVEYING SYSTEM

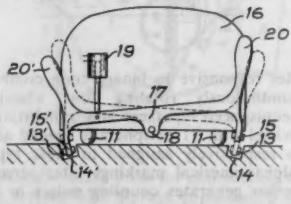
Rene Henri Charles Marty, 39, rue Cardinet, Paris 170, France

Filed Dec. 22, 1969, Ser. No. 887,255

Claims priority, application France, Dec. 30, 1968, 181,734

Int. Cl. B61b *13/00;* **E01b** *25/28, 7/12*

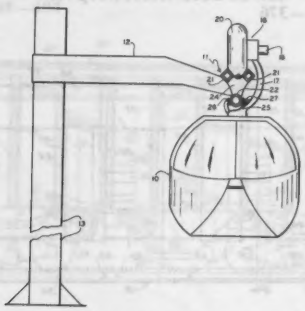
U.S. Cl. 104—88 **10 Claims**



A conveying system including a complex track the sections of which are connected by junctions. Means are provided to

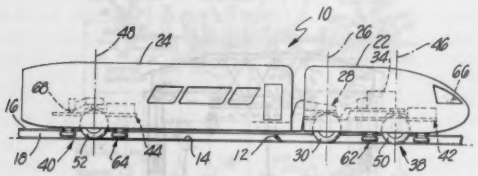
prevent the vehicles reaching simultaneously the junction from impinging against each other and to this end feelers are provided on such vehicles so that in the case of a simultaneous arrival, the vehicles are constrained to follow each its normal track assumed to lie parallel with that followed by the other vehicle. Means are furthermore provided for controlling without any computer the path followed by the vehicles over the complex track in a manner somewhat similar to that of automatically controlled lifts.

3,593,666
MONORAIL SYSTEM
Phillip D. Savage, Malone, N.Y., assignor to Hall Ski-Lift Company, Inc., Watertown, N.Y.
Filed Oct. 15, 1969, Ser. No. 866,571
Int. Cl. B61b *3/00*; **E01b** *25/22*
U.S. Cl. 104—89 **6 Claims**



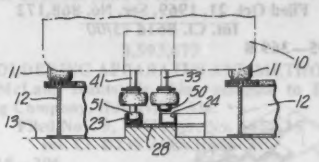
A monorail car is suspended from pneumatic tired wheels riding on the rail. The rail comprises a plurality of tubes secured spaced apart by web members secured thereto at spaced intervals along the rail. A pair of upper tubes are spaced horizontally and have downwardly and inwardly sloped top surfaces on which the sides of the tire treads rest. Low-friction pads on either side of a lower tube are attached to the car and can slide along the side of the lower tube to prevent side sway. A heated or cooled liquid or gas may be pumped through each of the tubes so expansion joints are not needed.

3,593,667
GUIDANCE SYSTEM FOR DUAL-MODE VEHICLE
Raymond L. Morris, 1028 15th Ave., Honolulu, Hawaii
Filed July 7, 1969, Ser. No. 839,412
Int. Cl. B62d *11/00*; **B61b** *13/00*
U.S. Cl. 104—120 **7 Claims**



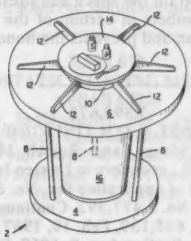
A vehicle capable of operation on a track having a central guide rail, or on city streets, on highways, or the like. When operating on the track, guide wheels engageable with opposite sides of the central guide rail serve to guide the vehicle. For operation off the track, the guide wheels are retracted and the vehicle is steered by the operator thereof. Retractable locking bars permit pivoting of the guide wheels between their extended and retracted positions, and are extended to positively lock the guide wheels in their extended positions or their retracted positions. An irreversible worm drive insures against creeping of the locking bars out of their extended, locking positions.

3,593,668
STATIC SWITCH
George J. Adams, Santa Monica, Calif., assignor to Stanray Corporation, Chicago, Ill.
Filed July 24, 1969, Ser. No. 844,566
Int. Cl. E01b *7/12*; **B61b** *13/04*; **F01b** *23/06*
U.S. Cl. 104—130 **2 Claims**



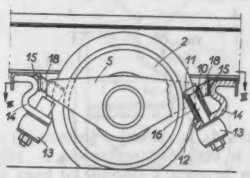
A switching system for a vehicle requiring no moving parts in the road bed or track. A pair of channels positioned at the switch to provide vehicle guidance along the main line and the diverging line, respectively. Guide wheels in the vehicle engaging the track for guidance during normal operation, and auxiliary wheels in the vehicle for use at the switching area for selectively engaging one of the track channels.

3,593,669
EATING UNIT
Richard K. Zimmerly, 7920 Fishback Road, Indianapolis, Ind.
Filed May 14, 1969, Ser. No. 824,471
Int. Cl. A47b *13/02*
U.S. Cl. 108—150 **5 Claims**



An eating unit comprising a circular table which facilitates stand-up eating. The table has a circular base and a circular eating surface. These components are in a spaced apart relationship and are connected by a plurality of supports. The eating surface incorporates a central aperture. A waste container is positioned on the base below the central aperture. The waste container is of such a diameter that it is adapted to pass through said supports.

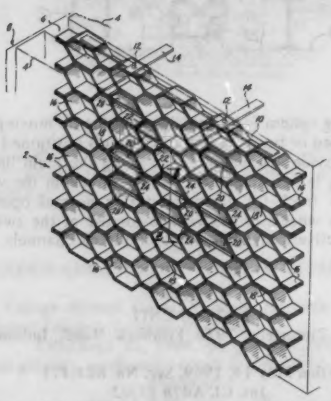
3,593,670
MINE CAR SUSPENSION
Serge Aubert, Ville D'Avray, France, assignor to Societe Industrielle Delattre-Levivier "S.I.D.L.", Paris, France
Filed June 20, 1969, Ser. No. 835,118
Claims priority, application France, Aug. 2, 1968, 161,740
Int. Cl. B60b *17/00*; **B61d** *11/00*; **B61f** *5/36*
U.S. Cl. 105—209 **1 Claim**



A vehicle, especially a narrow-gauge, mine car, having at least one axle on each of the journals of which the body rests

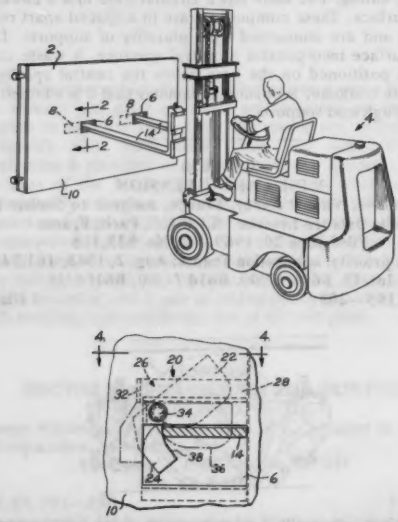
by way of an equalizer bar having an axle box within the width of the wheel.

3,593,671
REINFORCED LOAD SPACER
Glenn D. Bramlett, Stockton, Calif., assignor to Narad, Inc., Wayne, Mich.
Filed Oct. 21, 1969, Ser. No. 868,172
Int. Cl. B61d *45/00*
U.S. Cl. 105—369 B **6 Claims**



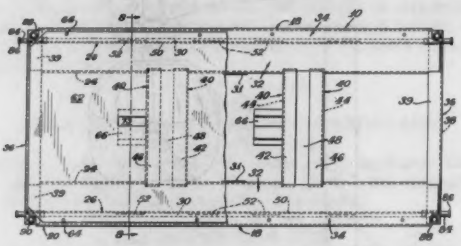
An expandable honeycomb structure, of corrugated paper board, is suspended between a load and an adjacent surface in a freight carrier, to fill the space and prevent load shifting. Transverse rigid members in certain of the cells limits their horizontal contraction and prevents the honeycomb structure from sagging unduly.

3,593,672
APERTURED PANEL WITH TINE-GRIPPING MEANS
Henry D. Breen, Chicago, and Russell M. Loomis, Palos Heights, both of, Ill., assignors to Unarco Industries, Inc.
Continuation-in-part of application Ser. No. 612,611, Jan. 30, 1967, now Patent No. 3,477,392, Continuation-in-part of application Ser. No. 615,139, Feb. 10, 1967, now Patent No. 3,431,015. This application Apr. 8, 1968, Ser. No. 719,551
Int. Cl. B61d *45/00;* **B60p** *7/14*
U.S. Cl. 105—376 **17 Claims**



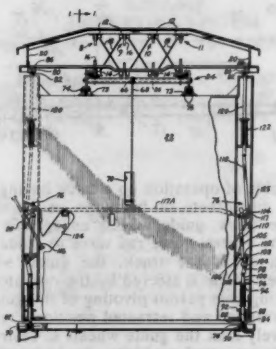
A panel for separating lading is provided with spaced ports in its face adapted to receive therein the tips of a forklift truck's tines, and means are provided in the ports for gripping said tines to prevent the panel from falling when the tines lift the panel. The gripping device is mechanically actuated into a positive gripping relationship with tines of a forklift truck when the tines are inserted in the ports and when the panel is lifted in a vertical position by the tines and supported thereby. When the panel is no longer supported by the tines, the gripping devices may be moved or move out of gripping relationship with the tines and the tines then may be easily removed from the ports.

3,593,673
PALLET CONSTRUCTION
Russell M. Loomis, Palos Heights, and Henry D. Breen, Chicago, both of, Ill., assignors to Unarco Industries, Inc.
Continuation-in-part of application Ser. No. 612,611, Jan. 30, 1967, now Patent No. 3,477,392, Continuation-in-part of application Ser. No. 615,139, Feb. 10, 1967, now Patent No. 3,431,015. This application May 14, 1968, Ser. No. 729,080
Int. Cl. B61d *45/00;* **B60p** *7/14*
U.S. Cl. 105—376 **11 Claims**



A pallet which may also serve as a load divider formed of a frame fabricated from sheet material to define hollow edge beams, end beams and hollow intermediate beams, the edge and intermediate beams being adapted to receive the tines of a forklift truck, and the opposite faces of the frame being covered by smooth panels so that the pallet is reversible. Pins, secured in the corners of the pallet, project beyond the ends thereof to support the pallet in tracks. Open sockets may be provided in the edge beams at the corners of the pallet to receive posts by which the pallets can be stacked or to receive casters.

3,593,674
LADING CAR AND BULKHEAD ARRANGEMENT
Irvan L. Winterfeldt, Crestwood; Leslie W. Martin, Chicago, and Samuel H. Enochian, Thornton, all of, Ill., assignors to Unarco Industries, Inc.
Filed Mar. 21, 1969, Ser. No. 809,185
Int. Cl. B60p *7/14*
U.S. Cl. 105—376 **1 Claim**



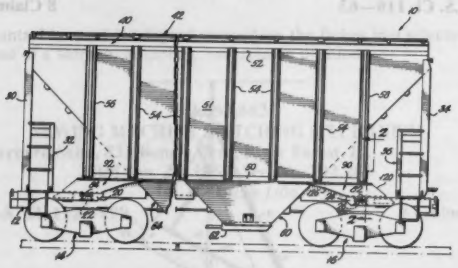
A lading car and bulkhead arrangement includes a car and a space divider bulkhead therein, the car having a floor, a

pair of load bearing upstanding end walls and a spinelike beam structure which is carried by the end walls and extends centrally of the car in rigidifying relationship to the car body. Outwardly extending tracks are formed on the beam structure and a moveable carriage is suspended from rollers which roll upon the track. The bulkhead is suspended from the carriage and sprocket and apertured timing means is provided on the carriage and underside of beam structure to effect nonbiased longitudinal movement of the bulkhead in the car. A slotted latching assembly is provided in the bulkhead to effect latching of the bulkhead with the floor in a predetermined longitudinal position in the car irrespective of the variation in distance between the tracks and floor of the car.

3,593,675
RAILWAY CAR CONSTRUCTION

Danilo A. Dominguez, Wayne, N.J., assignor to Magor Railcar Division, Fruehauf Corporation, Clifton, N.J.

Filed Feb. 27, 1968, Ser. No. 708,586
Int. Cl. B61d *7/00, 49/00*
U.S. Cl. 105—404 **9 Claims**

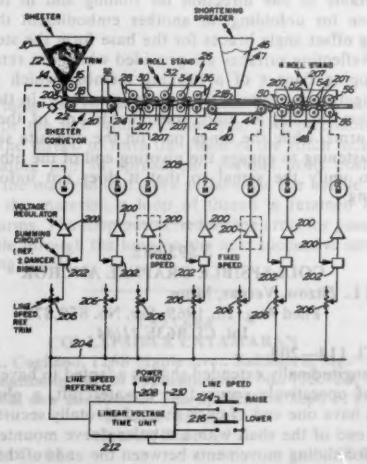


The underframe means of a railway car includes bolster means adjacent opposite ends thereof. Transition means is mounted at the four corners of the car over the bolster means. Each transition means is of generally channel-shaped cross-sectional configuration and includes an upper flange attached to the side of the car and a lower flange attached to the underframe of the car whereby the transition means is adapted to transfer loads between the underframe and the sides of the car and to support the sides at a horizontal level substantially above the underframe means.

3,593,676
DOUGH SHEETING APPARATUS

Francis R. Reid, and Selwyn Jones, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Apr. 4, 1969, Ser. No. 813,504
Int. Cl. A21c *3/02*
U.S. Cl. 107—12 **14 Claims**

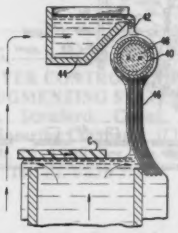


A dough sheeting apparatus composed of a series of adjacent roll stands each including several pairs of vertically spaced rolls. Each successive pair of rolls is spaced slightly closer together than the one next to it for the purpose of reducing the thickness of the sheet. A depending loop of dough is maintained between each pair of rolls. A sensing arm contacts each depending loop and maintains the speed of the next downstream pair of rolls at an appropriate speed to prevent the dough from stretching or accumulating between the adjacent pairs of rolls.

3,593,677
SOLDERING APPARATUS AND METHOD

John H. McLain, Huntsville, Ala., assignor to Brown Engineering Company, Huntsville, Ala.

Filed Nov. 9, 1967, Ser. No. 681,615
Int. Cl. B23k *3/06;* **H05k** *3/34*
U.S. Cl. 118—206 **12 Claims**

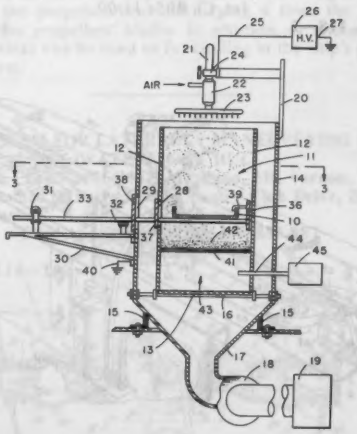


Apparatus for applying solder to solderable substrates such as circuit boards includes a brushlike applicator. Molten solder is supplied to the brush and flows onto an article which is to be soldered. A bath of molten solder may be provided adjacent the end of the applicator so that both sides of a substrate may be soldered simultaneously.

3,593,678
ELECTROSTATIC COATING METHODS AND APPARATUS

Emery P. Miller, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

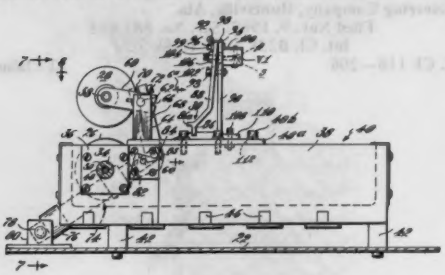
Division of Ser. No. 544,594, April 22, 1966, Patent No. 3,513,011. Filed Jan. 2, 1969, Ser. No. 810,056
Int. Cl. B05b *5/02*
U.S. Cl. 118—630 **10 Claims**



An apparatus for coating a surface of an article with particles of a powder. A gas-permeable plate is mounted in a chamber and is used to support a layer of particles in the chamber. Means passes gas through the plate to cause the particles to form a cloud in the chamber. The article to be coated is in the cloud of particles. An electrode means is above the article to be coated with particles. Means

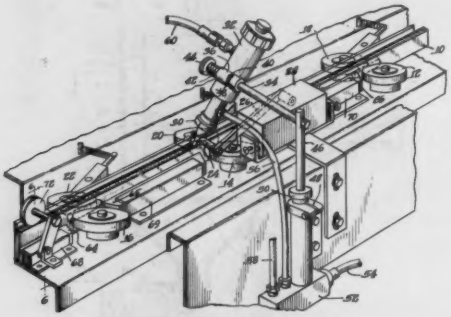
establishes on electrostatic field between the electrode means and the article for charging the particles and collecting their deposition on the article.

3,593,679
INSOLE CEMENTING MACHINE
Henry von den Benken, West Roxbury, Mass., assignor to Compo Industries, Inc., Waltham, Mass.
Filed June 11, 1969, Ser. No. 832,313
Int. Cl. B05c *11/00*
U.S. Cl. 118—2 **33 Claims**



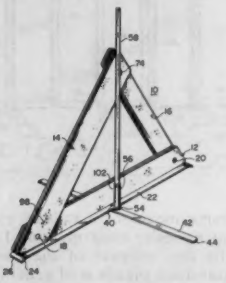
A machine for applying adhesive to one or both ends of an insole comprising an applicator roll having an adhesive-receiving surface of predetermined peripheral length, supported for rotation about a horizontal axis, a gauge stop supported at the upwardly moving side of the applicator roll, said gauge stop having a surface normal to a plane tangent to the top of the applicator roll and at a distance therefrom corresponding to the length at the end of the insole to which adhesive is to be applied, switch means for initiating rotation of the applicator roll when the insole is placed in engagement with the applicator roll with its end pressed against said gauge stop, and means for initially displacing the portion of said adhesive-receiving surface relative to the line of contact of said adhesive-applying roll with said plane of tangency.

3,593,680
AUTOMATIC AIR PAINTING APPARATUS
Jens A. Paasche, deceased, late of Wilmette, Ill., by Continental Illinois National Bank and Trust Company of Chicago, executor, 231 S. LaSalle St., Chicago, Ill.
Filed Sept. 5, 1969, Ser. No. 855,783
Int. Cl. B05c *11/00*
U.S. Cl. 118—2 **14 Claims**



Automatic air painting apparatus for painting precision stripes on relatively large, elongated workpieces. The workpieces are moved past an airbrush assembly by a conveyor mechanism. As they pass under the airbrush, the workpieces contact a roller which lifts the airbrush nozzle above the surface of the workpiece and holds it at a predetermined spacing in spite of variations in the height of the workpieces. When the roller is lifted by the leading edge of the workpiece, it actuates a microswitch that turns the airbrush on, and when the roller drops off the trailing edge of the workpiece, it automatically turns the airbrush off by releasing the same microswitch. To minimize inertia, the roller is positioned so as to contact the airbrush nozzle directly instead of being linked to the airbrush by a mechanical linkage, and the airbrush is mounted on a balanced, spring-loaded rotary mounting which enables it to respond very quickly to changes in the position of the roller. Two parallel airbrush assemblies and conveyor mechanisms are mounted on a common base and are driven by a single motor and supplied by a common source of paint and compressed air.

3,593,681
SIGNAL DEVICE
Sernovitz, Morton A., 8642 Keystone Ave., Skokie, Ill.
Filed Sept. 10, 1969, Ser. No. 856,704
Int. Cl. G08b
U.S. Cl. 116—63 **8 Claims**

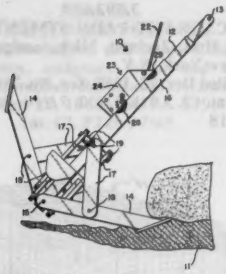


A compact foldable signal having a flat triangular configuration in open position characterized by a base member having a pivotable fore and aft support arm retractable against stop members, means to support a warning flag or flare and oppositely pivoted signal arms which fold with the support arm to a compact essentially rectangular form and unfold to an apex for snap attachment at their ends to each other. In one embodiment, the base is provided with oppositely offset stop members so that the pivotable fore and aft support arm is rotatable in one direction for folding and in the other direction for unfolding. In another embodiment the rivets holding offset angle braces for the base form the stop members. Reflecting surfaces are provided which are retained by overlapping flanges of a backing member which provides both rigidity and permanence to the structure. In the folded condition the flag or flare stand holds one of the folding signal arms, while the hinge part on the opposite side has a snap fastening to engage the pivoting end of the other signal arm to unify the signal so that it does not unfold while handling.

3,593,682
COLLAPSIBLE GRAPNEL ANCHOR
Ewald L. Zitzow, Vergas, Minn.
Filed Aug. 18, 1969, Ser. No. 850,877
Int. Cl. B63b *21/44*
U.S. Cl. 114—208 **7 Claims**

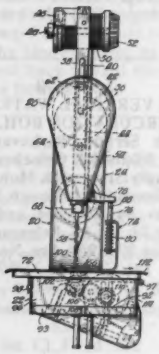
A longitudinally extended shaft is adapted to have one end thereof operatively secured to a watercraft, a plurality of flukes have one end of each thereof pivotally secured to the other end of the shaft with a tubular sleeve mounted on the shaft for sliding movements between the ends of the shaft, a link is pivotally secured to an intermediate portion of each of

the flukes and to the end of the tubular sleeve adjacent the other end of the shaft and releasable latch means, including a



control lanyard is adapted to position the flukes in a selected one of a storage, grappling, and release position.

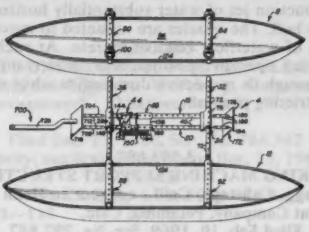
3,593,683
SEWING MACHINE STITCHING MECHANISM
Bernard Saltz, 831 Bonnie Brae, River Forest, Ill.
Filed Jan. 21, 1969, Ser. No. 792,269
Int. Cl. D05b *1/06*
U.S. Cl. 112—199 **3 Claims**



A portable electric sewing machine for sewing material, buttons or the like with a chainstitch. The mechanism for looping the thread to form the chain of the stitch includes a reciprocating pair of spreadable, parallel arms positioned beneath the material and work surface. As the needle passes through the material, a loop of thread is retained by the parallel arms. The loop positioned by the arms for passage of the needle through the loop on the next successive stroke of the sewing needle.

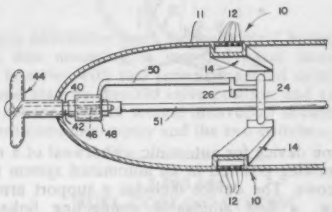
3,593,684
COLLAPSIBLE CATAMARAN
Joseph A. Cogliano, 1268 Maple Ave., Baltimore, Md.
Continuation-in-part of application Ser. No. 775,703, Nov. 14, 1968, now abandoned. This application Sept. 5, 1969, Ser. No. 856,525
Int. Cl. B63b *1/10*
U.S. Cl. 114—61 **18 Claims**

A collapsible assembly is disclosed which can be made into or converted into a catamaran, a swamp boat, a sail car, an



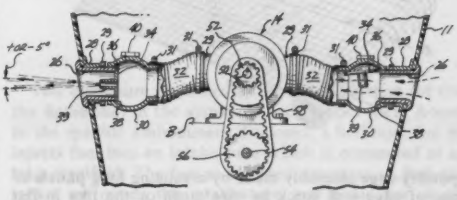
iceboat, a ski vehicle, a snowmobile, a snow blower (vehicle), etc.

3,593,685
BOUNDARY LAYER CONTROL AND PROPULSION AUGMENTING SYSTEM
Walter C. Cowles, Stamford, Conn., assignor to Esso Research and Engineering Company
Filed Feb. 26, 1969, Ser. No. 802,341
Int. Cl. B63b *1/34*
U.S. Cl. 114—67 **3 Claims**



Boundary layer separation in surface ships is controlled by drawing in sea water through a plurality of openings in the shell of the ship. These openings are provided in a pair of perforated panel that extend vertically from the flat of the ship's bottom, to near the waterline and are located on opposite sides of the ship near the stern where boundary layer separation would otherwise occur. The sea water sucked in from the boundary layer can be utilized to augment the propulsive thrust of the ship's propellers by forcing the water through the propellers and discharging it from the trailing edge of the propellers' blades. In addition, or alternatively, the sea water can be used to for cooling in the ship's propulsion system.

3,593,686
SYSTEM FOR LATERALLY MANEUVERING A WATERCRAFT HULL
Euvon G. Cooper, 1460 McLean Road, Mt. Vernon, Wash., and Thomas D. Perry, 1425 Country Club Drive, Burlington, Wash.
Filed Aug. 28, 1969, Ser. No. 853,887
Int. Cl. B63h *25/46*
U.S. Cl. 114—151 **4 Claims**



A reversely operated pump is medially located between the sides of a hull in open-ended duct means located below the

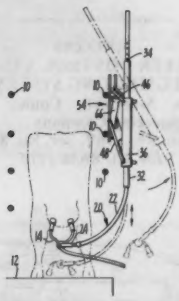
waterline through which water flows in either direction. Closely adjacent the orifices of said duct means is a jet nozzle to emit a reaction jet of water substantially horizontally outward of the hull. The nozzles are mounted to move upon the occurrence of waterflow relative thereto. At such time one nozzle is in an operative position and restricts outward flow of water through its respective duct orifice while the other is in a nonrestricting position.

3,593,687

MILKING MACHINE SUPPORT STRUCTURE

Douglas Clegg, Calistoga, Calif., assignor to Holm Tractor & Equipment Company, Petaluma, Calif.

Filed Feb. 10, 1969, Ser. No. 797,857
Int. Cl. A01j *07/00*
U.S. Cl. 119—14.1 **6 Claims**



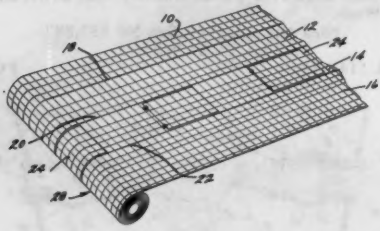
A retraction device for automatic withdrawal of a milking claw from milking position in an automated system for the milking of cows. The device includes a support arm for a milking claw, a first adjustable connecting linkage for suspending the arm from the wall of a stall and swinging the arm from a milking position underneath the cow to a laterally withdrawn position outside of the stall. Second adjustable connecting means permit the arm to be moved vertically in the milking position, and a single control is provided to move the arm upwardly as it swings out of the stall. The suspension arm preferably provides for pivotal movement about three parallel vertical axes in the milking position so that the milking claw may move freely with the cow while it is vertically supported by the arm.

3,593,688

ROLLUP POULTRY CAGES AND METHOD OF MAKING SAME

Voyd Lee Whitener, Indian River, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Aug. 20, 1968, Ser. No. 753,994
Int. Cl. A01k *31/06, 31/08*
U.S. Cl. 119—17 **13 Claims**



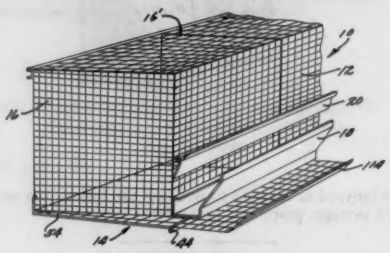
A poultry cage assembly made by arranging long panels or sections of cage wall stock as wire mesh or the like in flat planar form, with a side edge of each such section or panel directly adjacent that of another such panel, securing such panels together along such adjacent side edges, and rolling the interconnected panels along an axis perpendicular to their length to form a generally cylindrical bundle for shipping, storage, and the like.

3,593,689

POULTRY CAGE WITH ADJUSTMENT APPARATUS

Robert L. Van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Dec. 23, 1968, Ser. No. 786,177
Int. Cl. A01k *31/00, 31/14, 05/00*
U.S. Cl. 119—18 **20 Claims**



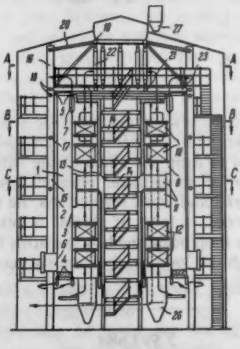
A poultry cage having a movably mounted member across its front which forms an upper sidewall part of a feeder trough disposed along the front of the cage, such that the member when raised decreases the effective depth of the trough and allows feeding through the lower part of the front wall, and when lowered increases the effective depth of the trough while allowing feeding through a higher part of the front wall. Also, the cage enclosure includes a floor which is vertically movable and adjustable between predetermined heights.

3,593,690

DRUMLESS-TYPE VERTICAL WATER TUBE NATURAL CIRCULATION BOILER

Anatoly Gavrilovich Serkov, Parkovaya ul., 3a, kv. 15, Belgorod; Dmitry Nikitovich Grinchenko, ul., Ya, Zhizhki, 9, kv. 5, Lvov; Vasily Sergeevich Moiseev, ul., Gagarina, 4, kv. 9, Belgorod; Gennady Vasilievich Maslovsky, ul., B Khmelnitskogo, 50, kv. 34, Belgorod, and Igor Petrovich Alexeev, ul., Litvinova, 71, kv. 13, Belgorod, all of, U.S.S.R.

Filed June 27, 1969, Ser. No. 837,197
Int. Cl. F22b *21/00*
U.S. Cl. 122—235 R **4 Claims**



A drumless-type vertical water tube natural circulation boiler, whose convective shaft is annular in horizontal cross section and disposed in the space defined externally by the internal waterwall of the boiler furnace which is annular in its horizontal cross section, the space defined by the convective shaft accommodating platforms for servicing the boiler, this being instrumental for facilitating the servicing of convection

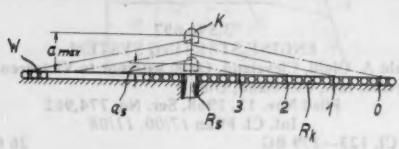
transfer surfaces, for arranging certain communication lines in the zone near to the servicing platforms and for simplifying the design of the bearing structure of the boiler.

3,593,691

WIDE JET SOOT BLOWER

Herbert Wirths, Eckenhagen, and Hugo Caldewey, Hamm, both of, Germany, assignors to L. and C. Steinmuller G.m.b.H., Gummersbach, Rhineland, Germany

Filed Apr. 28, 1969, Ser. No. 819,755
Int. Cl. F22b *37/48*
U.S. Cl. 122—390 2 Claims



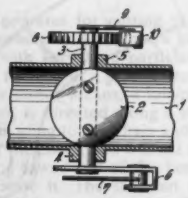
A method of cleaning a cooling pipe wall in fire and radiation chambers of boilers by means of a steam-operated wide jet soot blower having rearwardly directed blow nozzle means. A blowpipe is adapted to be advanced away from and retracted into the cooling pipe wall linearly during rotation simultaneously occurring to direct the nozzle means along a rotating path. There are steps of moving the blower with the nozzle means thereof closed in a direction linearly away from the pipe wall to a location representing approximately the intended maximum distance of the blower from the pipe wall to be cleaned, opening the nozzle means only when the blower has reached the location, and subsequently moving the blower with the nozzle means open along linear distance during rotating that results in directing the nozzle means in a rotating path back toward and into said wall while closing the nozzle means when the blower during its simultaneous linear and rotating movement back toward the wall has reached a desired safety distance from the wall.

3,593,692

ELECTRICAL FUEL INJECTION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Hermann Scholl, Stuttgart W; Norbert Rittmannsberger, Stuttgart I; Wolf Wessel, Stuttgart S; Wolfgang Rehmann, Stuttgart-Bad Cannstatt, and Josef Wahl, Stuttgart-Kaltental, all of, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 9, 1969, Ser. No. 826,058
Claims priority, application Germany, May 11, 1968, P 17 51 330.3
Int. Cl. F02d *5/02*
U.S. Cl. 123—32 EA 21 Claims



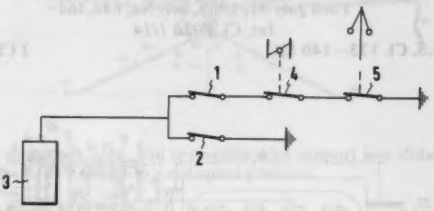
An electrically controlled fuel injection arrangement for internal combustion engines in which the fuel is injected through electromagnetically controlled valves. A control monostable multivibrator is actuated through a pulse emitter coupled directly to the crankshaft of the engine and emitting pulses synchronously with the speed of the engine. The pulse emitter actuates the monostable multivibrator which has a variable unstable state. A pulse generator coupled to the throttle of the engine emits a sequence of auxiliary control signals which extend the opening time interval of the injection valves during opening motion of the throttle, for purposes of increasing the quantity of injected fuel during engine acceleration.

3,593,693

SPARK TIMING CONTROL FOR VEHICLE ENGINES

Dietrich Seelmann-Eggebert, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 17, 1968, Ser. No. 784,347
Claims priority, application Germany, Dec. 23, 1967, P 15 76 693.5
Int. Cl. F02p *5/04*; F02d *11/10*
U.S. Cl. 123—117 2 Claims



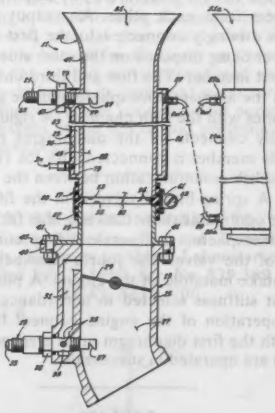
Ignition distributor spark timing control having a common control disc mounting, a retarded spark interrupter connected in series with two series-connected switches, respectively operated by throttle valve position and engine speed, and an advanced spark second interrupter shunted across the first-mentioned interrupter and the two switches.

3,593,694

FUEL-COOLING SYSTEM

Hilborn, Stuart G., South Laguna, Calif., assignor to Fuel Injection Engineering Company, South Laguna, Calif.

Filed May 5, 1969, Ser. No. 821,913
Int. Cl. F02d *3/04*
U.S. Cl. 123—119 R 24 Claims



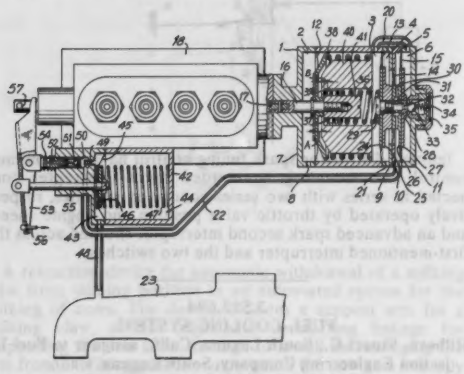
This disclosure describes a fuel-cooling system for cooling the liquid fuel in the system to avoid vapor lock. According to the specific embodiment disclosed, a fuel injection nozzle injects fuel into an intake tube which is connected to an intake manifold. The fuel so injected vaporizes. A fuel-cooling jacket surrounds the intake tube and liquid fuel is passed therethrough. The liquid fuel passing through the cooling jacket is cooled by the latent heat of vaporization from the vaporized fuel within the intake tube.

3,593,695

PNEUMATIC GOVERNOR FOR A FUEL INJECTION PUMP OF AN INTERNAL COMBUSTION ENGINE

Alexandr Kuzmich Avramenko, ulitsa Kultury, 11, kv. 89, Kharkov; Anatoly Iosifovich Vladimirsky, pereulok Kulbitsky, 18, kv. 1, Kharkov; Neukh Nokhimovich Gitlin, ulitsa Tamboskaya, 75, kv. 91, Leningrad; Om Iosifovich Zaets, ulitsa Vorobexa, 11, kv. 8, Kharkov; Jury Mefodievich Korchin, ploschad Rozy Ljuksemburg, 2, kv. 9, Kharkov; Vladimir Yanovich Kulbashny, ulitsa Gubkomovskaya, 48, kv. 4, Kharkov; Konstantin Mikhailovich Maskenskov, ploschad Rozy Maksima Gorkogo, 5/76, kv. 33, Gorky; Nikolai Gavrilovich Mozokhin, ulitsa Avtomobilnaya, 16, kv. 16, Gorky; Nikolai Ivanovich Orlov, ulitsa Semigradskaya, 65, kv. 6, Kharkov, and Leonid Nikolaevich Popov, bulvar Novatorv, 110, kv. 80, Leningrad, all of, U.S.S.R.

Filed July 31, 1969, Ser. No. 846,464
Int. Cl. F02d *1/14*
U.S. Cl. 123—140 MC 2 Claims



A pneumatic governor for a fuel injection pump of an internal combustion engine comprises a housing containing five chambers in a row with a plurality of diaphragms separating the chambers from each other. An output member of the governor is drivingly connected to the first diaphragm, the first chamber being disposed on the same side of said housing as the output member. The first and third chambers communicate with the ambient atmosphere and the second chamber communicates with the fifth chamber. A rigid central portion mechanically connects all the diaphragms except the first, and a nozzle member is connected with the rigid central portion to establish communication between the fourth and fifth chambers. A spring-biased valve is in the fifth chamber for controlling communication between the fifth chamber and ambient atmosphere, the nozzle being controlled by the operation of the valve. The fourth chamber communicates with the intake manifold of the engine. A plurality of springs of different stiffness selected in accordance with a desired mode of operation of the engine connect the rigid central portion with the first diaphragm in an arrangement such that the springs are operated in succession.

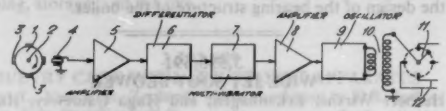
3,593,696

ELECTRONIC IGNITION SYSTEM FOR PRODUCING HIGH FREQUENCY SPARK TRAINS FOR INTERNAL COMBUSTION ENGINES

Angelo Raffaele Guido, Naples, Italy, assignor to Consiglio Nazionale Delle Ricerche-(C.N.R.), Rome, Italy

Filed Dec. 27, 1968, Ser. No. 787,324
Claims priority, application Italy, Feb. 29, 1968, 35171/68
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 E 3 Claims

An electronic ignition system for internal combustion engines is disclosed, the ignition system comprising circuit means controlled in synchronism with the engine for producing a high frequency spark train capable of ensuring a perfect ignition of the mixture into each cylinder of the engine.

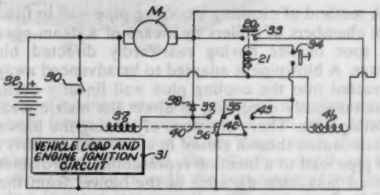


3,593,697

ENGINE STARTING SYSTEM

Donald A. Ciolli, Cleveland, Ohio, assignor to Victoreen Leece Neville, Inc., Cleveland, Ohio

Filed Nov. 12, 1968, Ser. No. 774,962
Int. Cl. F02n *17/00, 11/08*
U.S. Cl. 123—179 BG 26 Claims



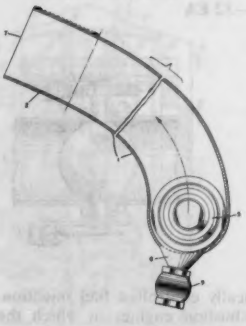
A vehicle engine starting system providing solenoid-operated positive engagement of the starting pinion with the ring gear on the engine flywheel before the starting motor is energized and inertia-operated disengagement of the pinion when the engine begins to overrun the starting motor. The system has an electrical lockout which positively prevents reengagement of the pinion as long as the engine ignition switch remains closed.

3,593,698

COMPRESSED AIR-OPERATED GUN

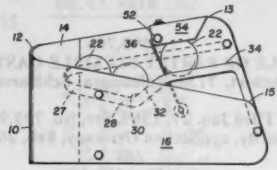
Pierre Culas, 152 Boulevard Poincare, Juan Les Pins, France

Filed July 29, 1968, Ser. No. 748,567
Claims priority, application France, Sept. 19, 1967, 21980
Int. Cl. F41b *11/00*
U.S. Cl. 124—11 4 Claims



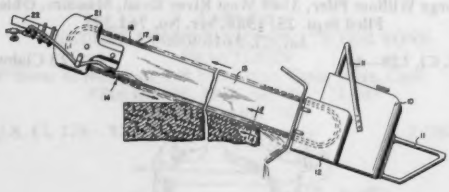
A launching device for clay pigeons and other projectiles comprising a tube preferably incurved over most of its length, the projectiles being forced through the tube by means of compressed gas, and one of the inner surfaces of the wall of the tube having a coefficient of friction greater than the others so that the projectile is caused to rotate thus imparting a more stable flight to it after it has left the tube.

3,593,699
APPARATUS FOR THROWING LIGHTWEIGHT BALLS AND THE LIKE
Clayton W. Chalupsky, Cedar Rapids, Iowa, assignor to Norman S. Wooldrige
Filed Jan. 16, 1969, Ser. No. 791,710
Int. Cl. F41b 7/00
U.S. Cl. 124—26 16 Claims



A machine for automatically feeding and continuously pitching lightweight balls at regular intervals in the same general direction. The machine utilizes the principle of a continuously revolving member that is temporarily restrained in its movement so that energy is built up and retained by said member, which energy is subsequently released to project the ball.

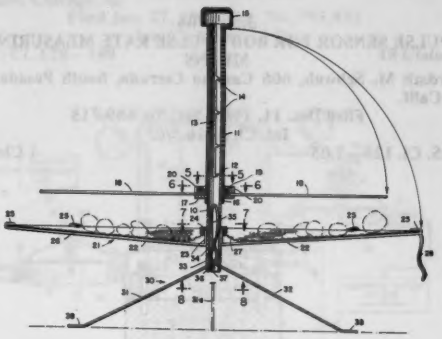
3,593,700
CHAIN SAW FOR SAWING VERY HARD MATERIAL AND METHOD OF SAWING
John V. McNulty, Norwich, N.Y., assignor to George P. Kingsley, Holland Patent, N.Y.
Continuation-in-part of application Ser. No. 568,854, July 29, 1966, now abandoned , and a continuation-in-part of 572,138, Aug. 12, 1966, now Patent No. 3,459,169. This application Oct. 3, 1968, Ser. No. 777,942
Int. Cl. B28d 1/08; B24b 55/02
U.S. Cl. 125—21 7 Claims



A method and apparatus for cutting very hard materials such as reinforced concrete. A chain saw has a chain formed of tooth members with very hard particles projecting from the teeth, the teeth running in a groove around a bar. As the chain is driven by a motor means, a low-pressure stream of liquid, such as water, is directed along a straight run of the chain. The liquid will cling to the chain and move at substantially the velocity of the chain, and will act to sweep particles of the material being sawed out of the kerf, as well as cool the chain and lubricate it. The saw can also have a nose wheel with circular blades on either side thereof for making plunge cuts.

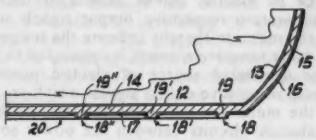
3,593,701
COLLAPSIBLE BARBECUE GRILL
Bertram L. Youmans, 8544 Rascher Ave., Chicago, Ill.
Filed Sept. 8, 1969, Ser. No. 855,977
Int. Cl. A47j 37/00; F24b 3/00; F24c 1/16
U.S. Cl. 126—25 A 6 Claims

Collapsible and portable barbecue grills embodying a center post structure with a vertically adjustable grill composed of vertically pivotable radial arms and a collapsible fire pan composed of vertically pivotable arms supporting a flexible, heat-resistant material, e.g., asbestos cloth, forming the



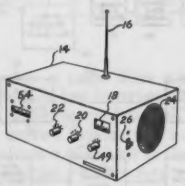
fire pan when open, and springable wire support legs slidable in the hollow post into a collapsed position.

3,593,702
NONSTICK RESIN-COATED COOKING UTENSILS
Emanuele Zigomalas, 20, Via Leonardo da Vinci, 20094 Corsico, Italy
Filed Dec. 10, 1969, Ser. No. 883,779
Claims priority, application Italy, Dec. 19, 1968, 25,348 A/68
Int. Cl. A47j 27/00
U.S. Cl. 126—390 10 Claims



The disclosure describes a cooking utensil, such as a frying pan, comprising a vessel-forming aluminum body having one or more preferably annular protusions downwardly projecting from its planar bottom for abutment on the parts and surfaces whereon the utensil are superimposed and supported for use, said body having its inner and outer surfaces coated with polytetrafluoroethylene (or equivalent nonstick resin) in their entirety except at the tips of said protusions where said abutment actually occurs.

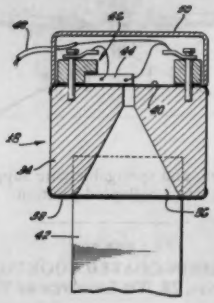
3,593,703
DIAGNOSTIC COUGH-MONITORING TECHNIQUES
Leonard C. Gunn, Chicago, Ill., and Donald A. Burns, Kenosha, Wis., assignors to Abbott Laboratories
Filed July 7, 1969, Ser. No. 839,309
Int. Cl. A61b 5/00
U.S. Cl. 128—2 R 5 Claims



The rate at which a human subject coughs may be determined by providing a microphone, a transmitter connected to

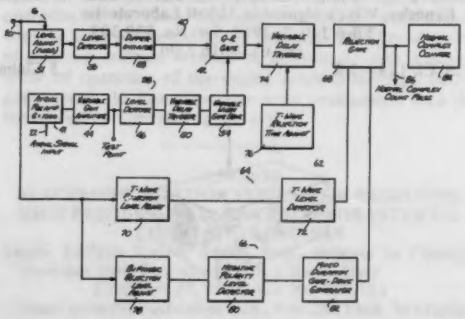
the microphone, a receiver, a counter, and a conditioning circuit that enables the counter to advance in response to a cough sound.

3,593,704
PULSE SENSOR FOR BODY PULSE RATE MEASURING MEANS
Ardath M. Schwab, 606 Camino Cerrado, South Pasadena, Calif.
Filed Dec. 11, 1967, Ser. No. 689,718
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 **1 Claim**



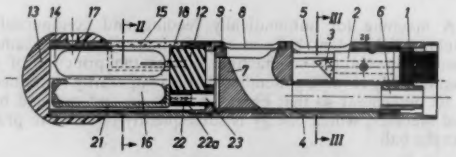
A measuring apparatus having a housing, an electric meter mounted therein and a temperature sensitive probe removably connected thereto and with an amplifier therein, and a source of electric power associated therewith to generate temperature responsive output signals which are received by the meter to thereby indicate the temperature of the body. A pulse sensitive element is connected to the housing, and the associated source of electric power, which generates pulse responsive output signals which are modified and fed to the meter for indicating the rate of the body's pulse. The electric circuits between the power source, the sensors and he the meter are normally open and easily operated pushbutton switches are provided to temporarily close one or the other circuit when a reading on the meter is to be taken.

3,593,705
ARRHYTHMIA MONITORING INSTRUMENT AND METHOD USING "NORMAL" AND "TOTAL" COUNTING CHANNELS
Randal Howard Thomas, Oreland, and Mary Louise Torchiana, Ambler, both of, Pa., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Oct. 3, 1968, Ser. No. 766,034
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 A **14 Claims**



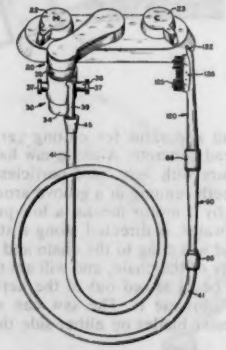
Monitoring apparatus and method for determining the presence of cardiac arrhythmias by means of pattern recognition techniques applied to each successive electrical heart cycle as represented by derived electrocardiogram waves; the total number of electrical cycles undergone by the derived electrocardiogram waves is ascertained in a first circuit and the number of cycles having predetermined normal characteristics during the occurrence of the total number of electrical cycles is derived in a second circuit; the outputs of the first and second circuits are fed to an indicator which indicates the presence of the arrhythmia.

3,593,706
FLEXIBLE OR PARTLY FLEXIBLE GASTROSCOPE
Herbert Schubert, 7134 Knittlingen, Schillerstrasse 31, Germany
Filed Jan. 27, 1969, Ser. No. 793,992
Claims priority, application Germany, Feb. 20, 1968, W 41 688
Int. Cl. A61b *1/06*
U.S. Cl. 128—8 **7 Claims**



A flexible gastroscope with a fiber-optical image conductor has a cylindrical distal head formed with a lateral viewing port next to an objective working into the image conductor, an adjoining lateral exit aperture for surgical implements, and a lateral illumination window just beyond that aperture. The illumination window leads into a chamber which contains two axially extending, laterally juxtaposed light sources, i.e. a U-shaped flash tube alongside the window and a lamp positioned to radiate through the flash tube and the window in series.

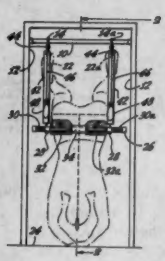
3,593,707
JET TOOTH BRUSH
George William Pifer, 3149 West River Road, Maumee, Ohio
Filed Sept. 25, 1968, Ser. No. 762,397
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **23 Claims**



A toothbrush with a jet nozzle at its end extending angularly toward the same side as the brush bristles and having a detachable handle, a flexible fluid duct from a fluid source, such as an adjustable hot and cold water spigot, and a valve for regulating the fluid for the jet, which valve may be at the source and/or in the handle. The handle may be hollow for connection to the flexible duct, or may be an electric or mechanical toothbrush handle, or a water jet or water pick handle. A source of dentrifrice and/or disinfectant may be

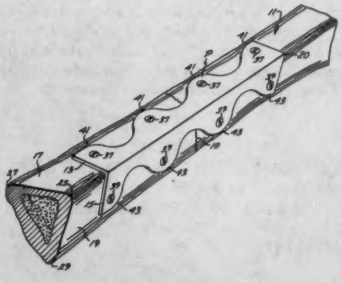
provided either in the jet brush attachment, in its handle, or from a reservoir connected by a separate duct to the jet brush attachment.

3,593,708
BODY SUSPENSION DEVICE
Victor Steele, 6311 Yucca, Hollywood, Calif.
Filed Aug. 11, 1969, Ser. No. 848,823
Int. Cl. A61h 1/02
U.S. Cl. 128—75 8 Claims



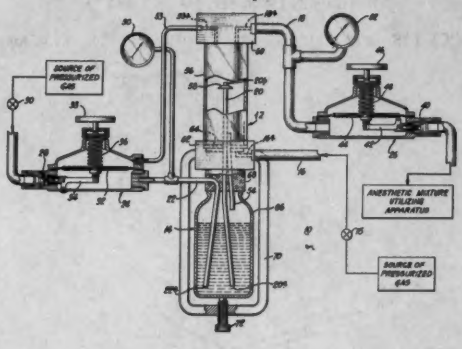
A device for suspending the portion of a human body above the pelvic region in an inverted position to provide a natural traction and to relieve the spinal column of gravitational compression which occurs when the body is in its normal upright position. The device includes a trapeze bar upon which is provided at least one rotatable platform having a padded face. When this face is initially disposed in a vertical position, the upper thighs of the legs may be pressed against it and if the upper part of the body is bent over the bar, the padded platform rotates on the bar to enable the person's body to be swung over the bar until the torso hangs downwardly, being supported by the thighs resting on the platform face. The legs of the body may be bent at the knees until the soles of the feet rest against vertical elements supporting the trapeze bar. Various other means are provided to facilitate the mounting and dismounting of the body for suspension and to render the latter more comfortable.

3,593,709
ANGULAR COMPRESSION PLATE FOR BONE FRACTURES
William X. Halloran, 440 Fair Drive, Costa Mesa, Calif.
Filed Oct. 28, 1968, Ser. No. 771,047
Int. Cl. A61f 5/04
U.S. Cl. 128—92 3 Claims



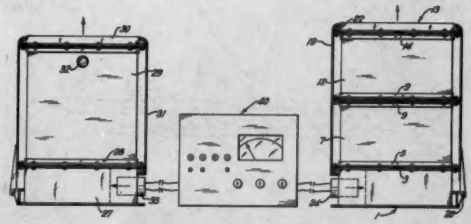
An angular compression plate for compressing a transverse fracture in a tibia bone, or the like, and including first and second flanges connected together along their adjacent edges. The flanges are slightly flexible with respect to one another for adjustment to accommodate varying angles between the first and second sides of the tibia. Thus, the plate may be placed across the fracture and secured to such adjacent sides of the tibia for maintaining the fracture in compression and will likewise provide support along two sides of the tibia.

3,593,710
ANESTHETIC APPARATUS
Francis J. Elchelman, La Grange Park, and Andrew A. Kenny, Chicago, both of, Ill., assignors to Chemetron Corporation, Chicago, Ill.
Filed Jan. 27, 1969, Ser. No. 793,932
Int. Cl. A61m 17/00
U.S. Cl. 128—188 18 Claims



A closed reservoir charged with a supply of liquid anesthetic material communicates via a conduit with a vaporizer chamber through which a stream of gas flows. The reservoir is pressurized by a pressure line communicating with the reservoir at a region beneath the surface of the liquid, and a pressure head is maintained independently of the level of the anesthetic material in the reservoir. The rate of flow of liquid through the conduit to the vaporizer chamber is controlled by regulating the pressure within the pressure line relative to the pressure within the pressure line relative to the pressure within the vaporizer chamber. The reservoir may be formed by an anesthetic containing bottle in sealing engagement with a support for the vaporizer to provide a compact assembly.

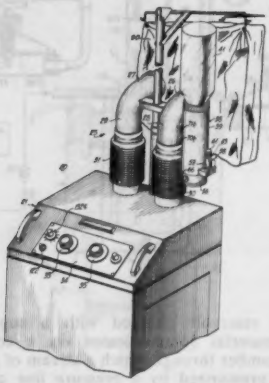
3,593,711
DUAL CANISTER CHEMICAL-TYPE LIFE SUPPORT SYSTEM
Charles H. Staub, Jr., Pittsburgh, and Miles J. McGoff, Warrendale, both of, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Feb. 28, 1969, Ser. No. 803,172
Int. Cl. A61l 9/10
U.S. Cl. 128—191 7 Claims



In a sealed chamber or room there are means for circulating vitiated air, which is low in oxygen, through a first body of carbon dioxide absorbing and oxygen producing chemical to remove excess carbon dioxide and to add oxygen. When the oxygen concentration in the air in the chamber reaches a predetermined maximum, means responsive to the oxygen concentration stops delivery of the air to the chemical body and circulates it instead through a second chemical body that absorbs carbon dioxide until the consumption of oxygen from the air causes the oxygen concentration to fall to a predetermined minimum. Then the airflow is switched back to the first chemical body to replenish the oxygen. Consequently

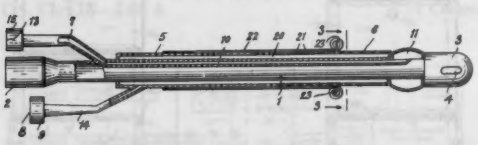
excess carbon dioxide is removed from the air continuously and oxygen is added to the air periodically as needed.

3,593,712
ULTRASONIC NEBULIZER
Robert L. Weaver, Toledo, and Frank D. Myrice, Perrysburg, both of, Ohio, assignors to Chemetron Corporation, Chicago, Ill.
Filed July 1, 1968, Ser. No. 741,451
Int. Cl. A61m *16/02*
U.S. Cl. 128—194 **3 Claims**



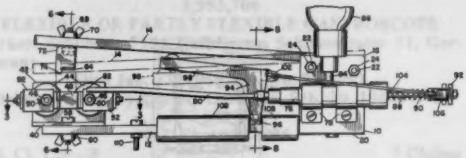
There is provided a nebulizer for use with oxygen tent equipment for controlled inhalation therapy. The nebulizer includes a vertical cylinder defining a liquid chamber with a piezoelectric transducer that closes the bottom of the chamber. A predetermined level of liquid is maintained in the chamber in direct contact with the transducer. A high frequency power source is connected to the transducer to provide ultrasonic vibrations thereof. The fluid in the chamber will be nebulized and suitable conduit means are provided for connecting the chamber to the gas flow from the oxygen tent equipment.

3,593,713
CATHETER COMBINATION
Stanley A. Bogoff, 20 Doctor Frank Rd., Spring Valley, N.Y., and Sheldon Rothenberg, 114 Monterey Drive, Manhasset Hills, N.Y.
Filed July 12, 1968, Ser. No. 744,380
Int. Cl. A61m *25/00*
U.S. Cl. 128—246 **3 Claims**



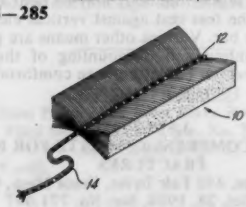
The improved catheter has a tubular body or stem that is apertured at its forward end or tip and is surrounded by an encircling jacket for a substantial portion of its length. A fluid feed tube leads into the jacket for the supply of a fluid thereinto, the jacket having a foraminous area, controllable in size situated adjacent to its forward end and through which area the fluid is emitted for direct treatment at the walls of a body orifice, or any cavity or opening in which the catheter is inserted. A tube for transmission of liquid or air extends longitudinally of the catheter body under the jacket and is in communication with an inflatable chamber located beyond the foraminous area of the jacket and rearwardly of the forward tip of the catheter body, said inflatable body, when filled with liquid furnished by said transmission tube, acting to retain the catheter in place in the body orifice or opening.

3,593,714
HAND-HELD BEAK TRIMMER AND VACCINATOR
James Lyon, 2922 Qualtraugh St., San Diego, Calif.
Filed May 19, 1969, Ser. No. 825,750
Int. Cl. A61b *17/20;* **A61d** *7/00*
U.S. Cl. 128—253 **4 Claims**



A hand-held unit with which the beak of a chicken, or other such bird, can be trimmed and cauterized simultaneously with the application of a dose of vaccine, by a single squeezing action of the hand. The beak-trimming elements are adjustable to the most convenient position for a particular operator, and also to provide a choice of trimming or cutting actions. The vaccination apparatus is carried entirely on the hand-held unit and the only accessory equipment required is a low voltage power supply for the resistance-heated trimming blade.

3,593,715
TAMPON
Kenneth S. Merrill, Wilbraham, Mass., assignor to Tampax Incorporated, Palmer, Mass.
Filed Nov. 5, 1968, Ser. No. 773,508
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **1 Claim**



A compressed absorbent tampon is disclosed characterized by the fact that it is formed from a pad of synthetic organic fiber tow, preferably a bulked and crimped rayon tow, in which the fibers extend in continuous unbroken form from one side edge of the pad to the other side edge thereof. A method of making the tampon is also disclosed.

3,593,716
COMBINED DISPOSABLE DIAPER AND BABY PANTY
Anneliese E. Vogt, 272 Lakeview Ave., Paterson, N.J.
Filed Aug. 19, 1969, Ser. No. 851,332
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **6 Claims**

A waterproof infant-conforming outer sheet of material partially encloses a multilayered strip of absorbent material.

The waterproof sheet is of a configuration and tacked at certain places so that upon application to the torso of an infant it forms a body-conforming panty.

3,593,717

RESERVOIR MENSTRUAL NAPKIN

John Leslie Jones, Sr., 1070 Glen Oaks Blvd., Pasadena, Calif.

Filed July 5, 1968, Ser. No. 742,922
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **7 Claims**

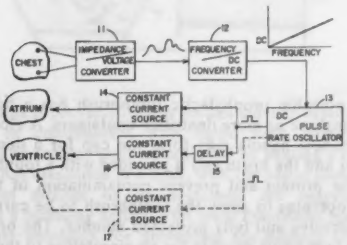
This invention teaches a new menstrual napkin embodying multiple-ply tissue paper sheets lying coplanarly adjacent and forming an absorptive section. The absorptive section has a multiple, spaced pattern of coaxially concentric openings, in at least an appreciable fraction of the multiple plies of tissue paper, forming reservoir for the menstrual fluid volume prior to absorption of the fluid by the tissue paper. A pair of mounting and securing openings are provided, one at each opposed end of the napkin which pierces all layers of the napkin and is suitable for adaptively securing he napkin to a sanitary napkin support belt.

3,593,718

PHYSIOLOGICALLY CONTROLLED CARDIAC PACER

Jerome L. Krasner, Woburn, and Paul Nardella, Stougton, both of, Mass., assignors to Biocybernetics, Inc., Walertown, Mass.

Filed July 13, 1967, Ser. No. 653,056
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **11 Claims**



A cardiac pacer is described which uses a physiological function such as breathing rate, to vary the production of electronic pulses which are fed to a constant current source connected to the ventricle. A constant source compensates for the fibrotic growths that often occur around the electrodes implanted in the heart. In another variation, the pulses are fed to two separate constant current sources, one connected to the atrium and the other, with delay, to the ventricle.

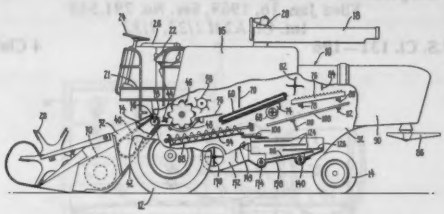
3,593,719

COMBINE WITH THREE-STAGE SEPARATION

Robert Ashton, Islington, Ontario, and Jerry M. Brzustowski, Toronto, Ontario, both of, Canada, assignors to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada

Filed Apr. 2, 1969, Ser. No. 812,750
Int. Cl. A01f *12/00*
U.S. Cl. 130—21 **9 Claims**

A combine harvester thresher with three stages for the separation of grain from the crop material. The three stages include a cylinder and open grate concave, a raddle and



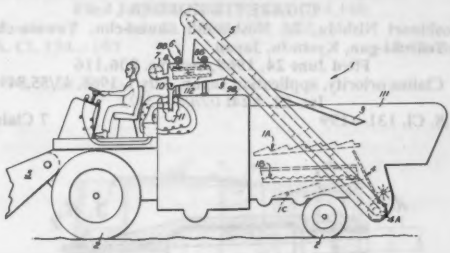
fanning mill, and straw walkers. The grain separated in all three stages is conveyed to a shaker shoe for cleaning.

3,593,720

COMBINE GRAIN LOSS SIGNAL

John R. Botterill, Rugby; Kepkay: Leslie L., Leamington Spa; Philip L. Dodd, Coventry, and William J. Radburn, Kenilworth, all of, England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed Mar. 3, 1969, Ser. No. 803,791
Claims priority, application Great Britain, Mar. 6, 1965, 10777/68
Int. Cl. A01f *12/52*
U.S. Cl. 130—27 W **4 Claims**



A combine harvester thresher grain loss monitor which includes, a secondary grain separating and cleaning apparatus which receives at least part of the crop material expelled from the primary grain separating and cleaning apparatus and separates and cleans any grain still present in the crop material, an electronic apparatus to measure the flow rate of cleaned grain discharged from the secondary grain separating and cleaning apparatus, and an indicator which indicates the flow rate of the grain which the primary grain separating and cleaning apparatus failed to separate and clean.

3,593,721

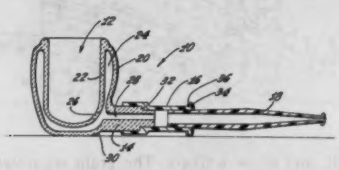
PROCESS FOR THE PRODUCTION OF TOBACCO FOILS AND PRODUCTS THEREOF

Franz-Bernhard Knop, Monheim Rhineland, and Werner Scherff, Hilden Rhineland, both of, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen

Filed Nov. 12, 1969, Ser. No. 876,084
Claims priority, application Germany, Dec. 4, 1968, P 18 12 601.7
Int. Cl. A24b *03/14*
U.S. Cl. 131—140 **9 Claims**

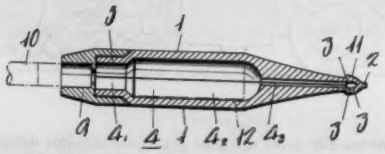
In the process of producing tobacco foils comprising the steps of mixing a slurry of tobacco dust with a water-soluble binder to form a moldable slurry, forming a tobacco foil or film and drying said tobacco foil or film, the improvement which consists of using as said water-soluble binder, a water-soluble methylcellulose containing from 0.05 to 0.25 carboxymethyl groups and also containing from 1.4 to 2.1 methoxy groups per anhydro glucose unit in said methylcellulose.

3,593,722
CERAMIC PIPE
Sydney R. Witz, Los Angeles, Calif., assignor to Cal-Witz Corporation, Los Angeles, Calif.
Filed Jan. 16, 1969, Ser. No. 791,569
Int. Cl. A24f 1/22, 1/32
U.S. Cl. 131—196 4 Claims



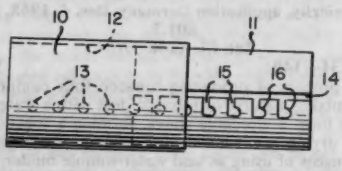
A double bowl ceramic pipe wherein the pipe is constructed from a low fire porcelain composed of various clays and including talc and ground tile so that the porcelain is more porous than many of the prior art high fired porcelains and so that the pipe does not conduct heat as quickly as the ordinary high fire porcelains. The present invention also includes the use of a hollow stem member that is offset from the bowl of the pipe so that the opening into the inner bowl from the stem is on a straight line to facilitate the cleaning or clearing of the opening even during smoking. Finally, the present invention is directed to a pipe having a bit made of a flexible plastic material which bit fits over and frictionally engages the stem.

3,593,723
CIGARETTE HOLDER
Yoshinori Nishida, 26 Hoshimoto okuno-cho, Yawatu-cho, Tsuzuki-gun, Kyoto-fu, Japan
Filed June 24, 1969, Ser. No. 836,116
Claims priority, application Japan, July 1, 1968, 43/55,849
Int. Cl. A24f 07/00, 13/02
U.S. Cl. 131—199 7 Claims



A cigarette holder having a pair of recesses formed in the sides of the holder at its mouthpiece end and the holder being divisible into separable upper and lower parts by a hinge at the mouthpiece end of the holder, thereby preventing direct striking of tobacco smoke against mouth tissues and permitting simple and positive cleaning of the holder.

3,593,724
LONGITUDINALLY ADJUSTABLE HAIR ROLLER
Antonio E. Leal, 1601 Pasadena St., San Antonio, Tex.
Filed Sept. 16, 1969, Ser. No. 858,281
Int. Cl. A45d 2/02
U.S. Cl. 132—39 3 Claims



This specification discloses a hair roller that is longitudinally adjustable. It comprises two plastic elements. These are an outer cylindrical sleeve formed with a longitudinal row of aligned inwardly projecting teats and an inner sleeve that is snugly received in the outer sleeve. The inner sleeve is formed with a longitudinal slot in which the teats are received and movable therein. Opening into this slot are a series of equidistantly spaced circumferential slots in which the teats are also movable. Each circumferential slot terminates in a locking notch.

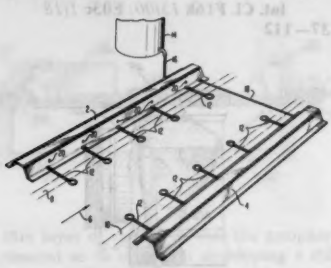
3,593,725
PORTABLE PROPHYLACTIC TOOTHBRUSH
Francisco Ortega, Etna No. 104, Mexico 20, City, and Pablo Ortega, Colon 2-208, Queretaro, both of, Mexico
Filed June 17, 1969, Ser. No. 834,025
Int. Cl. A45d 48/18
U.S. Cl. 132—84 B 1 Claim

A portable prophylactic toothbrush has a hollow handle housing one or more dentrifice containers. A closure plug for the hollow handle may form the cap for a dentrifrice container and the brush end is provided with a fountain-pen-type cap to protect and prevent contamination of the brush. It also operates to allow the toothbrush to be carried about in unobtrusive and fully protected manner. The brush cap may have lugs which provide for air circulation to the brush when the cap is in place. Various types of disposable dentrifrice containers may be employed such as simple tubes having a double fold at one end and a single fold at the other end; closed envelopes provided with a rupturable end; and the like.

3,593,726
TIRE SPRAYING APPARATUS
Barton Lockhart, 905 Red Oak Lane, Corsicana, Tex., and Travis C. Harris, deceased, late of Ardmore, Okla. (by Edward Harris, administrator), said Harris assignor to said Lockhart
Filed Mar. 13, 1969, Ser. No. 807,133
Int. Cl. B60s 3/04
U.S. Cl. 134—45 11 Claims

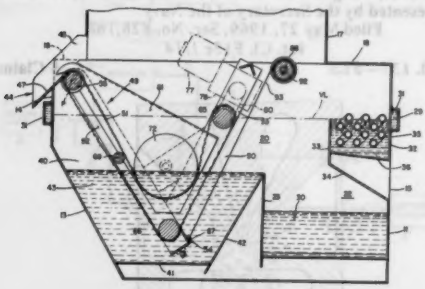
Chemical cleaning solutions are sprayed on the sidewalls of a vehicle tire by spray nozzles which are spaced longitudinally along both sides of the vehicle's path. Looped resilient conduits in the track of the tires form a portion of a

flow path leading from a source of cleaning solution to the nozzles, and check valves are appropriately placed so that



compression of the resilient conduits by a tire wall discharge the solution from the nozzles onto the tire sidewalls.

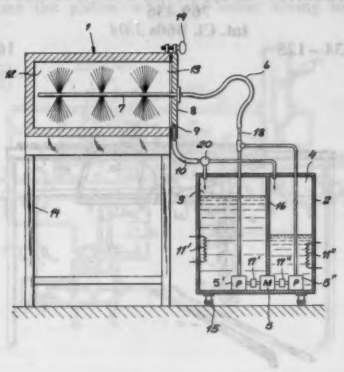
3,593,727
MOVING BELT-TYPE DEGREASER
Charles A. Black, Rockfield, Ky., assignor to Detrex Chemical Industries, Inc., Detroit, Mich.
Filed Sept. 4, 1968, Ser. No. 757,376
Int. Cl. B08b *3/06, 3/08*
U.S. Cl. 134—57 **15 Claims**



An apparatus is provided which utilizes solvent vapor-type degreasing, in combination with liquid bath degreasing techniques. The solvent vapor is achieved by heating a liquid solvent which is contained in a tank, with the vapor passing a zone wherein articles to be degreased are suspended, preferably in a tumbling action. The usual condenser type of safeguards are provided, for preventing the passage of solvent vapors outwardly of the machine, to the room wherein the machine is contained. A particularly novel apparatus is provided for conveying articles to be degreased into the solvent bath and for tumbling such articles within that bath.

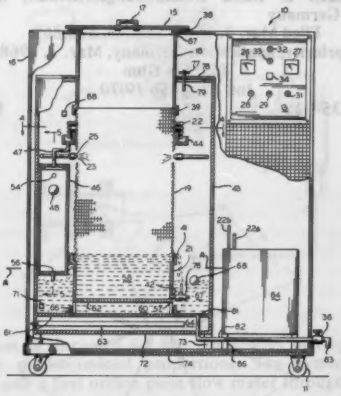
3,593,728
CLEANING UNIT FOR FRYING, BROILING OR DEFROSTING CHAMBER
Paul Sauer, Burg, Germany, assignor to Burger Eisenwerke Aktiengesellschaft
Filed Oct. 6, 1969, Ser. No. 864,145
Claims priority, application Germany, Mar. 25, 1969, G 69 11 912.6-7401
Int. Cl. B08b *9/00, 3/02*
U.S. Cl. 134—96 **7 Claims**

A portable cleaning unit for a frying, broiling or defrosting chamber, open to one side, has a lid emplaceable across the open side to leave only a drain aperture at the bottom, the lid carrying an elongate spray nozzle with ports for the discharge of a high-pressure wash liquid onto the chamber walls. The wash liquid is fed to the nozzle from a wheeled tank to which the spent liquid is returned via the drain; a dual pump in the



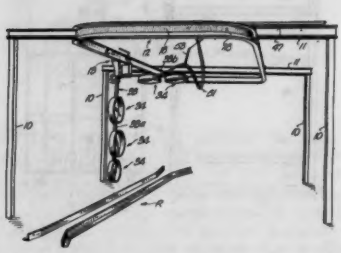
tank and a set of valves enable a switchover from the wash liquid to a rinse liquid.

3,593,729
VAPOR DEGREASER
David Goldware, 3858 North Cicero Ave., Chicago, Ill.
Filed July 29, 1968, Ser. No. 754,140
Int. Cl. B08b *3/02, 3/08*
U.S. Cl. 134—103 **8 Claims**



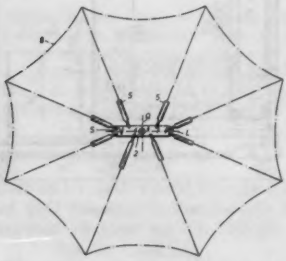
A portable degreaser comprising two concentric tanks separated by a perforated wall. The concentric tanks are an immersion tank located within a solvent-boiling tank which serves as an offset-vapor-generating sump. The rinse and spray area above the immersion tank is surrounded by a perforated wall. Boiling solvent is on the other side of the wall. Condensing coils encircle the perforated wall at the top of the spray area and thus, are exposed to the vapor an all sides. A gutter immediately below the condensing coils returns the condensed liquid into a separate distillate tank equipped with a water separator. The spray jets are supplied with the distilled solvent from the distillate tank. The distillate is kept hot since the lower portion of the tank is positioned within the boiling sump.

3,593,730
MECHANIZED CARWASHING APPARATUS
Lawrence R. Burchett, Leawood, Kans., assignor to Kwiki Systems, Inc.
Continuation of application Ser. No. 531,383, Mar. 3, 1966, now abandoned. This application Oct. 21, 1968, Ser. No. 769,436
Int. Cl. B60s *3/04*
U.S. Cl. 134—123 16 Claims



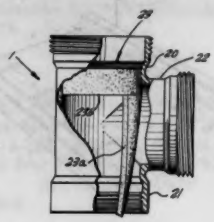
A closed loop track is supported above an automobile, the track having mounted thereon a carriage which travels around the track and which carries a spray mechanism for spraying the vehicle during travel of the carriage around the track. The carriage is so mounted that the jet reaction from the spray assists in providing traction. The spray units are rotary jet-powered arms.

3,593,731
COLLAPSIBLE UMBRELLA LYING FLAT WHEN CLOSED
Tilmann Schultes, Solingen-Weyer, Germany, assignor to Kortenbach & Rauh Kommanditgesellschaft, Solingen-Weyer, Germany
Filed Mar. 3, 1969, Ser. No. 803,869
Claims priority, application Germany, Mar. 2, 1968, K 60 463/33a Gbm
Int. Cl. A45b *19/10*
U.S. Cl. 135—25 8 Claims



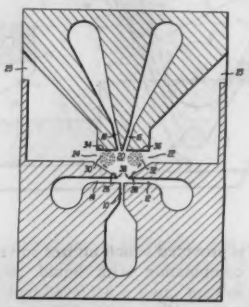
A collapsible umbrella frame lying flat when closed, which comprises a stick, a first member forming notch means connected to one end of said stick, a second member forming runner means displaceably mounted on said stick and movable toward and away from said first member, and umbrella-cover-supporting means pivotally connected to said members, at least one of said members when viewed in the axial direction of said stick having a relatively long and narrow shape, and pin means arranged in at least said one member and pivotally connecting the respective adjacent umbrella cover supporting means thereto.

3,593,732
TEE JOINT WITH FLOW-DIVERTING VALVE
Ernest A. Holscher, 440 St. Katherine Drive, Pasadena, Calif.
Filed Mar. 12, 1969, Ser. No. 806,461
Int. Cl. F16k *15/00*; E03c *1/18*
U.S. Cl. 137—112 9 Claims



A tee joint is provided with a flexible elongated tongue that normally covers the transverse arm of the tee joint and is fixed inside the tee joint at a point near the junction of the transverse arm and one of the in-line arms. The flexible tongue is part of a rubber insert having two transverse tabs that are bonded to the interior surface around the perimeter the one in-line arm of the tee joint.

3,593,733
INTERNAL FEEDBACK PROPORTIONAL FLUERIC AMPLIFIER
Gary L. Roffman, and Richard Deadwyler, both of Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy
Filed May 27, '969, Ser. No. 828,188
Int. Cl. F15c *1/14*
U.S. Cl. 137—81.5 5 Claims

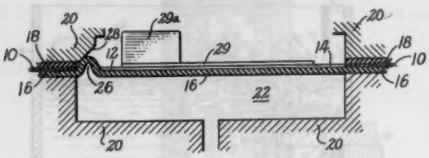


An internal feedback proportional flueric amplifier which includes a power jet input channel, a left control input channel, a right control input channel, a first output channel and a second output channel. Blunt splitters are provided such that flow from the power jet input channel when entering the interaction region within the amplifier will create internal feedback vortices therein. The effect of the vortices so created is to cause low-pressure areas along the sides of the power jet flow so that when a control signal is applied to one of the control input channels a high-pressure gain, stable, minimum noise amplifier will be obtained.

3,593,734
PRESSURE-RESPONSIVE ELEMENT
Philip H. Sanford, Walpole, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Continuation-in-part of application Ser. No. 772,595, Nov. 1, 1968. This application Oct. 30, 1969, Ser. No. 872,720
Int. Cl. F15c *3/04*, *1/10*
U.S. Cl. 137—81.5 53 Claims

A pressure- and force-responsive element formed by etching a thin, flexible metal plate with a U-shaped cutout to

define a planar tonguelike element supported at one end in cantilever fashion for bending motions about a hinge axis at the region of support. The etched plate forms one part of a multilayer sandwich construction which in one embodiment



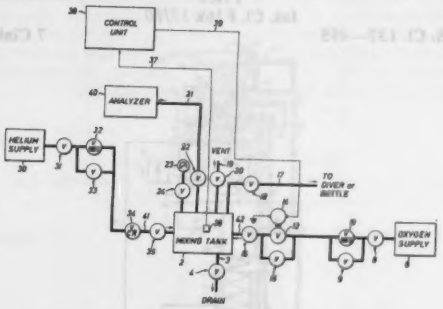
includes a thin layer of rubber to seal the periphery of the cantilever element so as to permit developing a differential pressure thereacross. Both force-balance and motion-balance configurations are included. The cantilever elements are used in an alarm device and a pneumatic timing unit.

3,593,735

METHOD AND APPARATUS FOR MAINTAINING A PRESELECTED PARTIAL PRESSURE

Max A. W. Reiher, Gretna, La., assignor to Dick Evans, Inc., Harvy, La.

Filed Sept. 4, 1968, Ser. No. 757,317
Int. Cl. A62b 7/02; G05d 11/035
U.S. Cl. 137—88 **10 Claims**



Improving gas-mixing methods and apparatus for maintaining a preselected oxygen partial pressure in breathing gas supplied to a diver under an abnormal pressure. A mixing tank with separate gas inputs is provided to receive and blend together oxygen and filler gas according to a preselected ratio as breathing gas is withdrawn from the tank by the diver. More particularly, a pair of helical tubing lengths or strings are arranged about the inside surface of the tank to receive and dispense filler gas and oxygen uniformly along the length of the tank. A control circuit is also provided to continually measure the molecular oxygen content of the tank, and to admit oxygen whenever the molecular oxygen content drops below a preselected level.

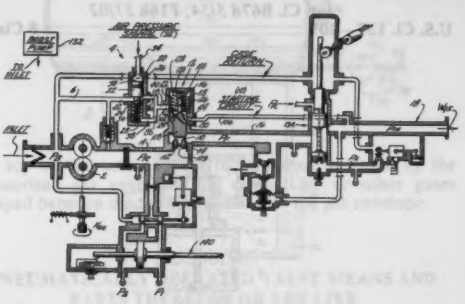
3,593,736

SLUG PUMP AND PRESSURIZING VALVE FOR FUEL CONTROL SYSTEM

Albert H. White, Wethersfield, assignor to Chandler Evans Inc., West Hartford, Conn.

Filed May 19, 1969, Ser. No. 825,818
Int. Cl. F02c 7/26, 9/04
U.S. Cl. 137—110 **13 Claims**

A slug pump and pressurizing valve are fluidly interconnected in a starting circuit of a fuel control system for a gas turbine engine. The pressurizing valve fluidly interconnects two segments of the main fuel supply line for providing a regulated pressure in one of the segments. The slug pump is used in the starting operation to expel a volume of fuel contained within the pump and thus momentarily propel a burst of fuel to the engine. The slug pump includes a chamber and either a piston or a diaphragm to expel the fuel. The pressurizing valve has tow springs which bias a piston, the face of which is exposed to the segment of the main fuel supply line in which the fuel pressure is to be regulated. One spring always biases the piston, while the other spring biases the piston only after the piston moves to a predetermined position. When a predetermined pressure is applied to the exposed face of the piston by the main fuel pump, the piston moves upwardly to close off the starting circuit. After a sufficient pressure is applied to the exposed face, the other spring causes the pressure adjacent the exposed face to be regulated.

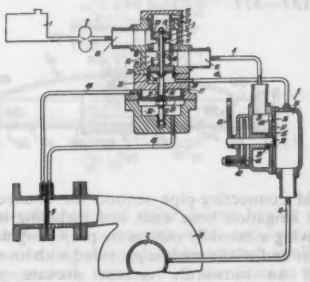


3,593,737

LIQUID-MIXING SYSTEMS

George H. Higgins, Leamington Spa, England, assignor to Coventry Climax Engines Limited, Coventry, England

Filed June 30, 1969, Ser. No. 837,686
Int. Cl. G05d 11/02
U.S. Cl. 137—100 **8 Claims**



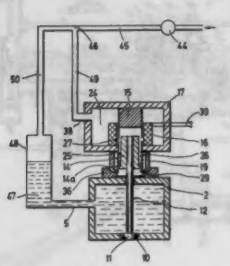
A system is disclosed for the continuous mixing of two liquids in predetermined proportions. The system has a governor and a first orifice plate flow meter through both of which the first liquid flows to a point where it is mixed with the second liquid, the governor having a movable closure member which, as it moves from an open to a closed position progressively reduces the flow of the first liquid through the governor. A pressure difference developed across the first flow meter is conducted to a diaphragm in the governor which acts in response to the flow the first liquid to bias the closure member towards its closed position with a force which increases as the flow rate of the first liquid increases. The mixed liquids pass a second orifice plate flow meter across which a pressure difference is developed and is conducted to a second diaphragm in the closure member. The second diaphragm acts to bias the closure member towards its open position with a force which increases as the flow of the mixed liquids increases. The closure member adopts an equilibrium position under the influence of the two biassing forces.

3,593,738

ELECTROMAGNETIC INJECTION VALVE

Achilles Baerfuss, Oberwil, Switzerland, assignor to Aktiengesellschaft Fur Biologische Verfahrenstechnik, Basel, Switzerland

Filed Sept. 2, 1969, Ser. No. 854,690
Claims priority, application Switzerland, Sept. 5, 1968, 13348/68
Int. Cl. B67d 5/54; F16k 31/02
U.S. Cl. 137—209 5 Claims



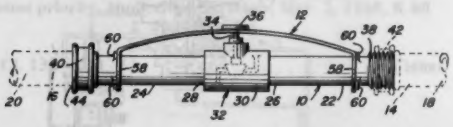
An electromagnetic injection valve in which a valve in a valve chamber is connected to and actuated by movable parts located in a pressure housing. The movable parts include bias means to bias the valve in its closed position, and are all subject to the same pneumatic pressure. With this arrangement, electromagnetic means which actuate the valve are only required to exert the force necessary to overcome the bias applied by the bias means to open the valve, irrespective of the pressure subsisting in the valve chamber.

3,593,739

SPRINKLER REGULATOR VALVE AND GUARD THEREFOR

Ovill X. Mercier, 737 North Minnesota Ave., Hastings, Nebr.

Filed Nov. 28, 1969, Ser. No. 880,636
Int. Cl. F16k 35/00
U.S. Cl. 137—377 10 Claims



A rigid connecting-pipe section for connection between adjacent irrigation hose ends and including a flow control valve having a laterally outwardly projecting actuating stem. The outer end of the stem is provided with an operating handle and an outwardly convex arcuate plate extends lengthwise along the connecting pipe section with the valve stem passing through the plate centrally intermediate its opposite ends. The opposite ends of the plate are secured to the corresponding ends of the connecting pipe section and the width of the plate at the operating handle for the stem is such that the plate projects outwardly from opposite sides of the handle. Further, the opposite longitudinal edges of the plate are arcuate and outwardly convex so as to reduce the possibility of the guard plate catching on ground-supported objects as the irrigation hoses and rigid connecting pipe section are dragged along the ground.

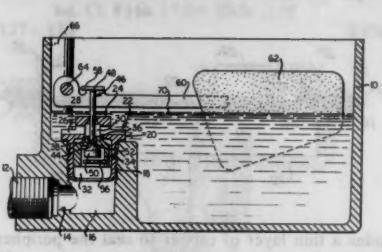
3,593,740

CARBURETOR FLOAT BOWL FUEL INLET VALVE

Robert S. Harrison, Detroit, and Joseph F. Lopiccola, Warren, both of, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 25, 1968, Ser. No. 778,436
Int. Cl. F16k 31/18
U.S. Cl. 137—411 7 Claims

A carburetor float bowl has a two-stage fuel inlet valve consisting of a small valve providing finite control for low rate of flow into the float bowl, and a larger valve actuated by the smaller valve to provide a relatively unrestricted opening between the fuel inlet and float bowl interior to permit operation of the fuel pump essentially at its full capacity if desired.

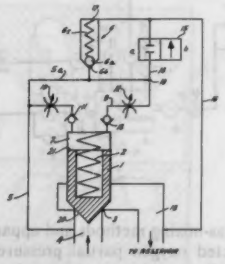


3,593,741

COMPOUND RELIEF VALVE

Hubert Odenthal, Wombach; Eckard Auditor, Partenstein, and Max-Otto Wintterlin, Lohr, all of, Germany, assignors to G. L. Rexroth GmbH, Lohr am Main, Germany

Filed July 14, 1969, Ser. No. 841,288
Claims priority, application Germany, July 13, 1968, P 17 75 178.9
Int. Cl. F16k 17/10
U.S. Cl. 137—495 7 Claims



A compound relief valve wherein the pilot valve is installed in a branch conduit connecting the high-pressure line with the reservoir and wherein the chamber of the main valve is connected with the branch conduit upstream of the pilot valve by two auxiliary conduits each of which contains an adjustable flow restrictor. The piston of the main valve opens at a speed which is determined by one of the flow restrictors and closes at a speed which is determined by the other flow restrictor.

3,593,742

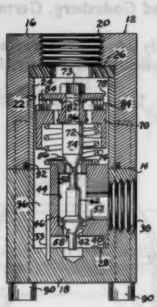
FLUID FLOW REGULATOR

Julian S. Taylor, 8600 S.W. 8, Oklahoma City, Okla.

Filed June 24, 1969, Ser. No. 836,123
Int. Cl. F16k 1/44
U.S. Cl. 137—504 3 Claims

A hollow housing, having inlet and outlet ports, forms a fluid passageway. A piston, loosely received by the inlet end portion of the housing, is coaxially connected with a throttle comprising a poppet-type valve stem which extends through and seats on respective end portions of a cage positioned in the outlet end portion of the housing communicating with the outlet port. A spring, interposed between the piston and the

cage, normally urges the throttle toward an open position and equalizes fluid pressure against the throttle at the respective ends of the cage in response to variations in fluid pressure across the piston.

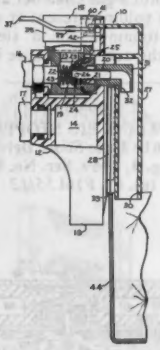


3,593,743

FAUCET-COUPLING ASSEMBLY FOR A WASHING MACHINE

Lauren W. Guth, Louisville, Ky., assignor to General Electric Company

Filed Sept. 19, 1969, Ser. No. 859,440
Int. Cl. F16k *45/00*
U.S. Cl. 137—562 10 Claims



A coupling assembly for connecting a washing machine to a water faucet having a handle member protruding from its body portion that serves as a spout for draining water from the assembly. The handle member is manually slidable to unseat a valve to thereby dispense the water therethrough. The handle member is linked to a quick-release connector that fastens the assembly to the faucet so that manipulation of the connector to release it is translated to the valve. Water pressure within the assembly is relieved as the release operation takes place.

3,593,744

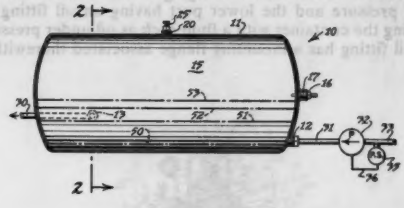
PNEUMATICALLY CONTROLLED WATER STORAGE SYSTEM

Henry Leo Smith, Route 4, Box 63, Springfield, Tenn.

Filed Feb. 19, 1970, Ser. No. 12,764
Int. Cl. E03b *11/06*
U.S. Cl. 137—568 8 Claims

A pneumatically controlled water storage system including a water tank having an inlet and an outlet at different water levels, and a precharged, expansible gas envelope within said tank to open and close the water outlet and the water inlet in response to changes in water pressure, and air volume control means for normally maintaining a water reservoir within said tank between maximum and minimum pressures.

This invention also contemplates an air discharge valve in the top of the tank adapted to be normally closed by the pressurized gas envelope, for venting air or other gases trapped between the top of the tank and the gas envelope.

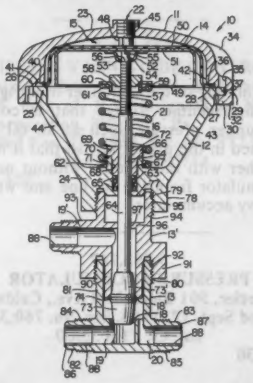


3,593,745

PNEUMATICALLY OPERATED VALVE MEANS AND PARTS THEREFOR OR THE LIKE

Ned C. Myers, Elkhart, Ind., assignor to Robershaw Controls Company, Richmond, Va.

Filed June 6, 1969, Ser. No. 831,044
Int. Cl. F16k *11/04*
U.S. Cl. 137—625.4 5 Claims



A pneumatically operated valve means having a housing means provided with two separate inlets and one outlet, the housing means having two spaced-apart and axially aligned valve seats respectively leading from the inlets to the outlet. A valve member is carried by the housing means and is disposed between the valve seats to respectively open and close the same in an alternate manner as the valve member is axially moved between its operating positions by pneumatically operated actuator means carried by the housing means.

3,593,746

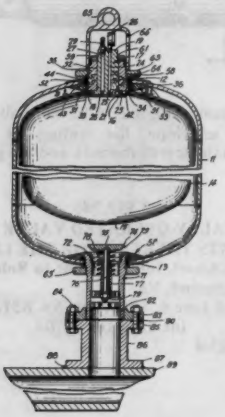
PRESSURE VESSEL

Murray Allewitz, and Abduz Zahid, both of Los Angeles, Calif., assignors to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed July 5, 1968, Ser. No. 742,596
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 1 Claim

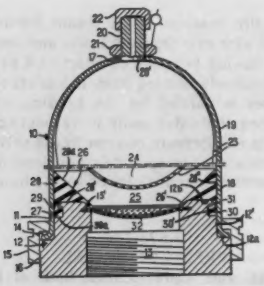
This invention relates to a pressure vessel of the type having a rigid container to be filled with fluid, usually oil and gas under pressure and having a deformable partition intervening between such fluids and more particularly relates to a pressure accumulator of relatively large size in the order of say 40-gallon capacity and which is extremely heavy and in the order of say 300 to 400 pounds. The partition is a bladder closed at one end and having an open mouth at its other end.

The container has longitudinally aligned ports at opposed ends and is designed to be mounted in vertical position with the upper port receiving a gas fitting to which the mouth of the bladder is secured, for charging of the bladder with gas under pressure and the lower port having an oil fitting for charging the container with a fluid such as oil under pressure. The oil fitting has a mounting flange associated therewith to



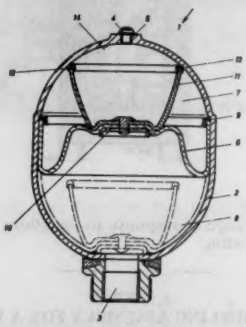
permit rigid mounting of the container in upright position on a suitable complementary flange that is connected to a source of oil under pressure such as an oil line. The gas fitting is mounted in the upper port so that it may readily be removed together with the bladder without need to disconnect the accumulator from the oil line and without need to handle the heavy accumulator.

3,593,747
PRESSURE ACCUMULATOR
Jacques H. Mercier, 501 Bloomfield Ave., Caldwell, N.J.
Filed Sept. 17, 1968, Ser. No. 760,335
Int. Cl. F16l *55/00*
U.S. Cl. 138—30 **4 Claims**



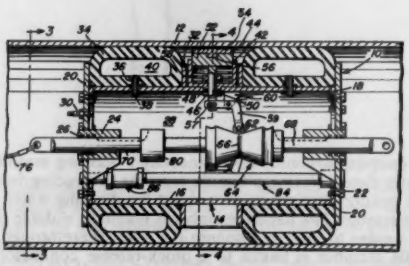
This invention relates to the art of pressure vessels and more particularly to a pressure accumulator of the type having a deformable bladder positioned in a container having a mouth with a closure plug positioned therein, the latter mounting an annular resilient member having a sealing portion integral with a supporting portion for the bladder, the latter being coaxial with the fluid port of the accumulator.

3,593,748
PRESSURE RESERVOIR FOR HYDROPNEUMATIC RESILIENT SUSPENSIONS FOR VEHICLES
Helmut Teerling, Bad Godesberg, Germany, assignor to Langen & Company
Filed July 24, 1969, Ser. No. 844,292
Claims priority, application Germany, Aug. 1, 1968, P 17 80 103.5
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 **4 Claims**



A pressure reservoir for hydropneumatic resilient suspensions for vehicles in which the interior of a housing constituting the reservoir is divided by a movable deflectable separating wall or partition into a gas chamber and a liquid chamber and a part of the gas volume present at a certain pressure is excluded for the attainment of a steeper characteristic resilient curve when the certain pressure is reached.

3,593,749
PIPELINE PIG STOPPER
Edwin E. Reardon, 2613 Lake Shore Drive, Mandeville, La.
Filed Aug. 4, 1969, Ser. No. 847,211
Int. Cl. F16l *55/12*
U.S. Cl. 138—93 **11 Claims**

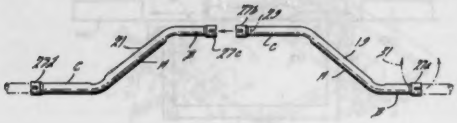


A pipeline is internally engaged by mechanical grippers and expansible sealing rims on the cylindrical core of a plug or stopper from which an actuating shaft projects. Displacement of the actuating shaft relative to the stopper when axially fixed to the pipeline, vents the sealing rims and disengages the grippers against a spring bias to releasably hold them in a retracted position.

3,593,750
EXHAUST SYSTEM ASSEMBLY
Wilbert H. Zautner, Grass Lake, Mich., assignor to Tenneco Inc., Houston, Tex.
Filed Dec. 20, 1968, Ser. No. 785,676
Int. Cl. F16l *9/22*
U.S. Cl. 138—109 **6 Claims**

An exhaust gas conduit assembly especially adapted for

use as replacement piping in internal combustion engine exhaust systems includes a kickup or overaxle section composed of two members which prior to assembly are identical in construction, being preferably of a generally Z-shape.



3,593,751

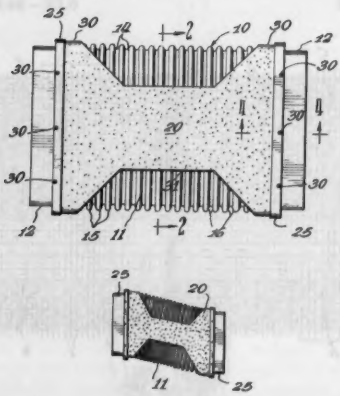
FLEXIBLE ELECTRICAL TRANSMISSION MEMBER

Donald L. Herling, Mundelein; Frank A. Larson, Lombard, and George F. Kovar, Berwyn, all of, Ill.

Filed June 11, 1969, Ser. No. 832,238

Int. Cl. F161 *11/00*; H01p *3/12*

U.S. Cl. 138—121 **6 Claims**



A flexible bellowslike electrical transmission member having rigid end sections is vibration damped by a jacket of resilient elastic material deposited on the bellows. The elastic jacket completely surrounds the ends of the bellows and has narrow strips extending along the middle of the bellows. The flexible bellows are joined to each rigid end section by a rigid face-to-face connection between a fin of the bellows and a surface of the rigid end section.

3,593,752

LOOM

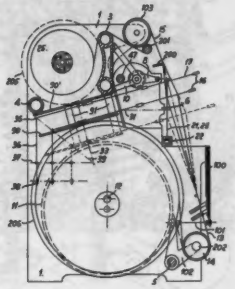
Albert Ernest Moessinger, Epalinges, Vaud, Switzerland, assignor to Moessinger S.A., Fribourg, Switzerland

Continuation-in-part of application Ser. No. 642,029, May 29, 1967, now abandoned. This application Sept. 10, 1969, Ser. No. 856,860

Int. Cl. D03d *47/00*

U.S. Cl. 139—18 **4 Claims**

A loom wherein one side of the machine is used for supplying the warp and weft material and removing the rolls of cloth while the details of the weaving operation are carried out on the other side. There is ready access to all parts of the loom, the complete weaving shed is readily visible and very little space is required compared to standard looms. The movements of the dobby are transmitted to the heald frames by means of interconnected links and levers and in a modification, cables and pulleys are substituted for intermediate links and levers. The movement of the frames and their levers is accomplished in substantially horizontal superposed planes while said movement is provided by members moving in juxtaposed vertical planes in a direction perpendicular to the movement of the frames.



3,593,753

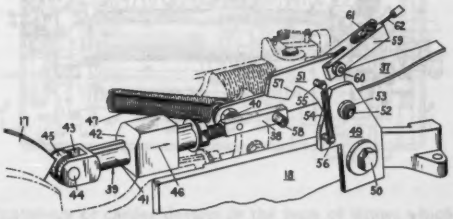
FILLING YARN GUIDE CONTROL

Albert H. Savoie, Slatersville, and Bertrand E. Guindon, Cumberland, both of, R.I., assignors to North American Rockwell Corporation, Pittsburg, Pa.

Filed Nov. 19, 1969, Ser. No. 877,994

Int. Cl. D03d *47/34*

U.S. Cl. 139—122 **4 Claims**



A control device for deactivating a normally pivotable filling yarn guide to prevent filling yarn from being presented to and wrapped on a continuously rotating filling storage cone during the formation of fringe on the shuttleless loom.

3,593,754

FILLING CONTROL MECHANISM

Anthony J. Tosches, Milford, Mass., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

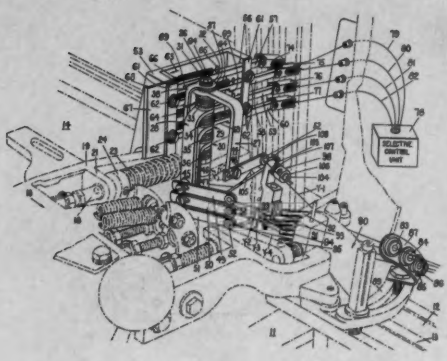
Filed July 3, 1969, Ser. No. 838,939

Int. Cl. D03d *47/38*

U.S. Cl. 139—122 **5 Claims**

A filling mechanism for shuttleless looms having a control unit and a mechanism functioning in cooperation therewith

for supporting and guiding at least two filling yarns from separate sources of supply and which are individually selectable in accordance with a desired pattern for presentation into the warp sheds by the filling inserting means.

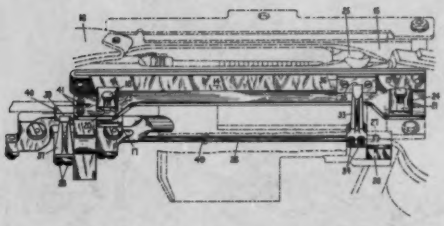


3,593,755

SHUTTLE-BINDER-ACTUATING MECHANISM

Joseph M. Budzyna, East Douglas, and Rocco H. Mucciarone, Franklin, both of, Mass., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1969, Ser. No. 814,049
Int. Cl. D03d *49/56*
U.S. Cl. 139—187 **1 Claim**



A binder control device for fly shuttle looms including a bar member with binder-engaging fingers fixed thereon and lever means for applying and releasing pressure on the binder through said bar member in timed relation with the receiving and picking of a shuttle from the shuttle box.

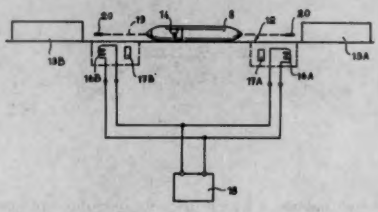
3,593,756

BROKEN WEFT THREAD DETECTOR

Sergio Vella, Biella, Italy, assignor to Roj Controlli Automatici Per L'Industria Tessile S.n.c., Biella, Italy

Filed Jan. 22, 1968, Ser. No. 699,720
Claims priority, application Italy, Dec. 14, 1967, 54111-A/67
Int. Cl. D03d *51/34*
U.S. Cl. 139—371 **6 Claims**

A detector device for detecting breakage of a weft thread in a loom utilizes induction between a coil carried by the shuttle and a fixed coil on the thrashboard to provide a signal-indicating thread failure. The coil on the shuttle is effective to induce a signal in the fixed coil only when a circuit is completed through the shuttle coil by contacts which are acted upon by the thread in the shuttle and which close when the tension in the thread relaxes.

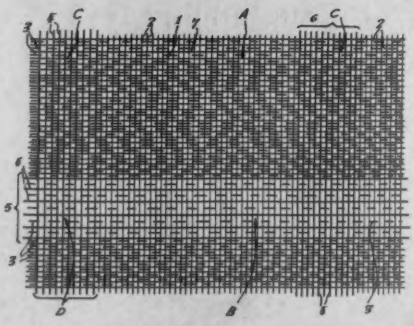


3,593,757

COVERS PRIMARILY FOR OPEN AIR WATER CONTAINERS

Reginald W. Haynes, Walmgate Road, Perivale, Greenford, Middlesex, England

Filed Jan. 8, 1969, Ser. No. 790,895
Int. Cl. D03d *15/00;* **E04h** *3/19*
U.S. Cl. 139—383 **5 Claims**



A woven fabric material comprising a basic material consisting of fine open mesh synthetic monofilament threads and which is reinforced by rip-resisting spaced-apart weft bands and spaced-apart warp bands, said bands being composed of closely related multifilament synthetic threads and serving to arrest ripping of the unreinforced basic material in the areas bounded by the intersecting weft and warp bands.

3,593,758

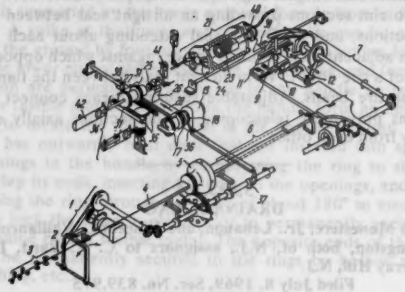
MACHINE FOR MAKING SINGLE-TURN WIRE LOOP WINDING SECTIONS AND PLACING THEM INTO GROOVES OF AN ELECTRICAL MACHINE

Vladimir Grigorievich Sergiev, Ulitsa 4 Parkovaya, 26, Ku. 9, Moscow, U.S.S.R.

Filed Jan. 14, 1969, Ser. No. 791,053
Int. Cl. H02k *15/00*
U.S. Cl. 140—1 **1 Claim**

A machine is provided for making single-turn wire loop sections of the windings of electrical machines and for placing these sections into the grooves of an armature part of an electrical machine. The machine comprises a mechanism for extending the sections and a mechanism for moving the end portions of the sections apart. Each of the mechanisms has an external cylinder and an internal cylinder disposed concentrically and mounted for rotation and axial displacement in relation to each other. The external cylinder of the mechanism which moves the end portions of the sections apart has an annular projection at the face end thereof

adapted, in the course of movement apart of the end portions, to enter between the external and internal layers of the



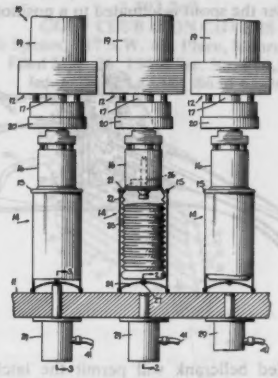
end portions of the sections placed into the grooves of the armature.

3,593,759
WIRE-TYING TOOL
Norman L. Wooge, R. R. 2, Ottawa, Kans.
Filed Oct. 29, 1969, Ser. No. 872,143
Int. Cl. B21f *9/02, 7/00, 15/02, 15/04*
U.S. Cl. 140—93.6 11 Claims

A wire-tying tool for forming a wire loop around articles to be tied together and for twisting together side-by-side portions of the loop to form a wire tie wherein the tool has a handle mounted on an elongate shaft having a wire passage therethrough and a pair of opposed arcuate arms mounted on one end of the shaft and having the free ends of the arms in spaced-apart aligned relation with the spacing therebetween being greater than a transverse dimension of articles to be tied together. A finger is pivotally mounted on the free end of each of the arms and each of the fingers has a wire passage therethrough with the passages being alignable with a wire passage through one of the arms to receive a wire from the wire passage through the shaft and handle. The wire is fed into the fingers and the arms and fingers are rotated to twist together the wire tie by operation of the handle and movement of the fingers is operative to cut the wire after the tie has been made.

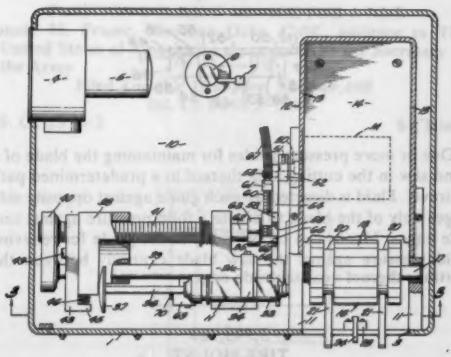
3,593,760
FILLING METHOD AND APPARATUS
Raymond W. Beffel, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed July 10, 1968, Ser. No. 743,745
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—3 12 Claims

Method of and apparatus for charging aerosol containers having a propellant-charging valve in the base by securing the container in its upright position to a filling platform adapted to support the container, and by introducing a



predetermined quantity of propellant up through the filling platform and into the container.

3,593,761
APPARATUS FOR PLACING FLUENT MATERIAL IN CARRIER DEVICES
Curtis L. Lorenz, 3437 Scenic Drive, Modesto, Calif.
Continuation-in-part of application Ser. No. 533,653, Mar. 11, 1966, now abandoned. This application Sept. 30, 1968, Ser. No. 763,847
Int. Cl. B65b *43/60*
U.S. Cl. 141—155 12 Claims

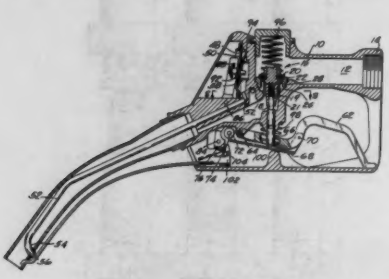


Containers or carrier devices in the form of straws which rest in longitudinal peripheral recesses of a rotary feeder are moved successively to an injection station to be filled by intermittent operation of a hypodermic syringe. Eccentric driving means actuates the rotary feeder by steps and operates the syringe in timed sequence with the steps. Means is provided for stopping the mechanism when it accumulates a supply of the filled straws.

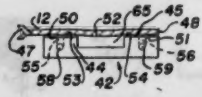
3,593,762
SAFETY FUELING NOZZLE
Roy W. Johnson, and Lourdes V. McCarty, both of Milwaukee, Wis., assignors to Milwaukee Valve Company, Inc., Milwaukee, Wis.
Filed Nov. 18, 1968, Ser. No. 776,686
Int. Cl. B67d *5/371*
U.S. Cl. 141—207 5 Claims

To open the valve assembly in the aspirator-type gasoline-fueling nozzle the manually operated handle is moved up-

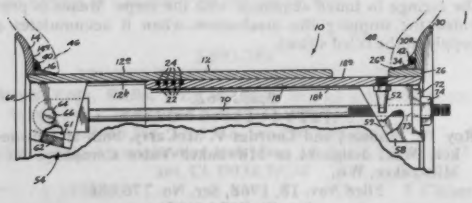
wardly but can act on the valve stem only if the actuating lever is resting on the end of the trip latch lever operated by the diaphragm. In order for the latch lever to be in the proper position the nozzle must be so positioned that the safety lever under the spout is actuated to a position in which



the spring-loaded bellcrank will permit the latch lever to move into position to be engaged by the actuating lever. Therefore, fuel will shut off either in response to liquid reaching the aspirator tip or in response to removal of the fuel nozzle from the tank to be filled.

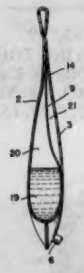
3,593,763
SAW-STABILIZING PRESSURE GUIDE
Peter J. Neild, North Vancouver, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada
Filed Sept. 17, 1969, Ser. No. 858,629
Int. Cl. B23d *55/08*
U.S. Cl. 143—160 **11 Claims**

One or more pressure guides for maintaining the blade of a band saw in the cutting area thereof in a predetermined path of travel. Fluid is directed by each guide against opposite side edges only of the blade to create a fluid pressure against said side edges. Means can be provided at the guide for relieving fluid pressure against the saw blade centrally between the portions thereof near said side edges.

3,593,764
TIRE MOUNT
Claude Freeman Smith, 111 S.W. Harrison, Portland, Oreg.
Filed Apr. 1, 1968, Ser. No. 717,532
Int. Cl. B25h *5/00;* **B29h** *5/18;* **B60b** *25/22*
U.S. Cl. 144—288 A **2 Claims**



An adjustable tubeless tire mount including two hollow cylindrical rim sections with one section telescoping into the other section adjacent their one set of ends, laterally spaced-apart flanges extending about the opposite set of ends of the rim sections and projecting radially outwardly therefrom, O-ring seals extending about the radially outward surface of the one rim section in the region of telescopic joinder between the two rim sections providing an airtight seal between the rim sections, and an O-ring seal extending about each rim section adjacent its associated flange, against which opposing beads of a tire abut to form airtight seals between the flanges and the tire beads. Adjustable securing means connect the sections preventing telescoping of the sections axially outwardly from each other.

3,593,765
DRAINAGE BAG
Martin Monestere, Jr., Lebanon, and Vincent L. Vaillancourt, Livingston, both of, N.J., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Filed July 8, 1969, Ser. No. 839,975
Int. Cl. B65d *31/00*
U.S. Cl. 150—1 **4 Claims**



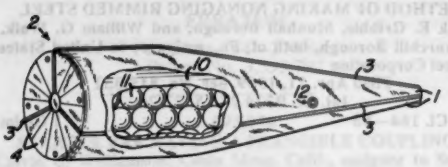
A bag for use in a closed urinary drainage system in which one wall of the bag is faced inwardly with a thin liner sealed to said wall around its entire periphery, the space between the liner and the second wall of the bag being in communication with the drainage tube and unvented while the space between the liner and the first wall is freely vented to atmosphere.

3,593,766
GOLF BAG
Charles E. Harmon, and Ruth C. Harmon, both of Venice, Fla., assignors to Handcraft Company, Inc., Princeton, Wis.
Filed May 21, 1969, Ser. No. 826,343
Int. Cl. A63b *55/04*
U.S. Cl. 150—1.5 B **20 Claims**

A tubular handle having a pair of rings mounted in spaced relation thereon for detachably or permanently securing a

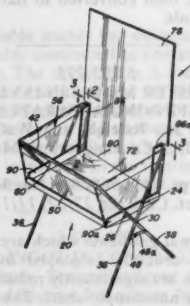
sleevelike golf club bag thereto. The bag includes ends which are folded back over the rings. The overlapped end portions of the bag have aligned eyelets to receive fastener elements for detachably securing the bag to the ring. A disc within the bag is supported by the lower ring and forms a bottom for the bag. A spike at the lower end of the handle can be pushed into the ground by foot pressure on a foot projection located at the lower end of the handle. The rings, spike, and foot projection are permanently anchored to the handle by lead or other fusible metal. Plugs within the handle form an obstruction to locate the fusible metal in the regions desired. Each ring has outwardly bent ends that are inserted into spaced openings in the handle by compressing the ring to slightly overlap its ends, inserting the ends in the openings, and then turning the ring through an angle of about 180° to mechanically lock the rings in place prior to permanently anchoring the same by the fusible metal. The opposite ends of the bag can be permanently secured to the rings by hollow rivets, stitching, etc..

3,593,767
BARRIER CONTAINER
Donald E. Smith, Towson, Md., assignor to the United States of America as represented by the Secretary of the Army
Filed Feb. 4, 1969, Ser. No. 796,367
Int. Cl. B65d *81/20, 89/22;* **G01m** *3/00*
U.S. Cl. 150—0.5 **8 Claims**



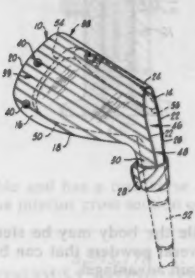
A container and method of containing, shipping, storing, and handling objects to prevent water vapor from entering the container atmosphere and to avoid toxic gas emission from the container atmosphere to the outside environment.

3,593,768
COLLAPSIBLE DISPLAY STAND
Ronald H. Taub, Highland Park, Ill., assignor to Charles Kirshbaum and Ethel Taub, as Trustees of the Taub Family Trust U/A, Sept. 1, 1967
Continuation-in-part of Ser. No. 645,438, June 12, 1967, Pat. No. 3,471,960.
Filed June 11, 1969, Ser. No. 832,183
Int. Cl. G09f *3/00, 1/10*
U.S. Cl. 150—49 **5 Claims**



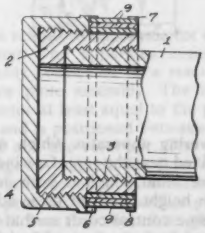
In a collapsible display stand, including a transparent bag suspended from a standing frame, an improved, unitary article-supporting floor and header panel assembly carried in the bag, the header panel joined to and extending upwardly of the floor and provided with laterally projecting tabs positioned to abut and bear upon the floor to obviate pivotal forward collapse of the header panel.

3,593,769
GOLF CLUB IRON COVERS
Billy Travis Spears, 717 S.W. 4th Place, Moore, Okla.
Filed Mar. 26, 1969, Ser. No. 810,551
Int. Cl. A63b *57/00;* **B65d** *65/00*
U.S. Cl. 150—52 G **6 Claims**



A golf club iron cover formed from a one-piece blank foldable along a fold-line, thereby forming a pair of sides, each side having a front, a rear, a top and a bottom portion. The sides are joined generally adjacent the front portions thereof, and the unconnected top portions and the unconnected rear portions of each side cooperate to form a receiving opening shaped to receive a portion of a golf club head inserted between the sides. A tab is detachably secured to the rear portions of the sides to affix the cover to a golf club iron.

3,593,770
POSITION LOCKING DEVICE FOR A NUT
Donald M. Fraser, Sherman Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Army
Filed Aug. 12, 1969, Ser. No. 849,408
Int. Cl. F16b *39/00*
U.S. Cl. 151—2 **6 Claims**

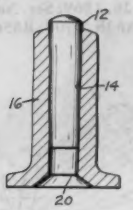


A position-locking device for a nut in which a flexible steel strip having notches along its opposite edges is wound between the nut and a collar which also are provided with notches in their opposing faces and which mate with the notches in the strip.

3,593,771
TIRE STUD HAVING LIGHTWEIGHT WEAR-RESISTANT PIN
Ragnar L. Carlstedt, and Emlyn N. Smith, both of Ligonier, Pa., assignors to Kennametal, Inc., Latrobe, Pa., by said Carlstedt
Filed Oct. 2, 1968, Ser. No. 764,541
Int. Cl. B60c *11/14*
U.S. Cl. 152—210 **1 Claim**

The invention concerns the tire stud consisting of a metal body with a head at one end and having a hard wear-resistant

pin extending into the body from the other side. The invention is particularly characterized in that the pin is cemented



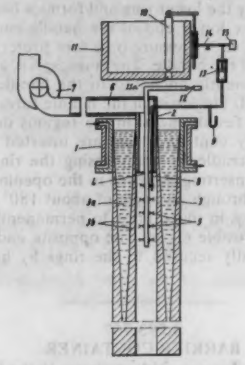
titanium carbide while the body may be steel or a sintered metal powder. Of several powders that can be used stainless steel powder has certain advantages.

3,593,772
DRAW CURTAIN APPARATUS
Garnett Abraham, 215 Manor Road, Staten Island, N.Y.
Filed Feb. 11, 1970, Ser. No. 10,351
Int. Cl. A47h *5/14*
U.S. Cl. 160—84 **11 Claims**

A window-covering apparatus which may include a stationary canopy fixed near the top of a window opening, and a movable shade or blind which is both adjustable in length and adjustable in height. Both of these adjustments are performed by the same control cords so that the window covering may be opened from the top or lifted from the bottom of the window while its length may be independently adjusted to completely cover, or partially cover the window opening.

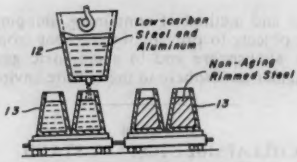
3,593,773
METHOD AND APPARATUS FOR SUPERVISING CASTING OF STEEL TUBES
Gerd Vogt, Krefeld; Josef Glaser, Gelsenkirchen; Manfred Strohschein, Gelsenkirchen; Johannes Kurth, Gelsenkirchen, and Rudolf Schwitzgobel, Gelsenkirchen, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany
Filed June 4, 1969, Ser. No. 830,296
Claims priority, application Germany, June 7, 1968, P 17 58 466.6
Int. Cl. B22d *13/10*
U.S. Cl. 164—4 **11 Claims**

Method and equipment for supervising the continuous casting of steel tubes is disclosed. The tubes are water cooled as they leave the die and the steam pressure is used as an indicator for the forming of cracks to control retarding or



stopping of the casting process at an early stage of crack forming.

3,593,774
METHOD OF MAKING NONAGING RIMMED STEEL
Frank E. Gribble, Munhall Borough, and William G. Walk, Churchill Borough, both of, Pa., assignors to United States Steel Corporation
Filed Apr. 11, 1969, Ser. No. 815,332
Int. Cl. B22d *27/18, 27/20*
U.S. Cl. 164—58 **1 Claim**

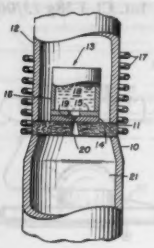


From a heat of rimming steel, a small portion is tapped off and killed by the addition of aluminum. The remainder of the heat is teemed into ingot molds so as to fill them only partially (e.g., to 85—90 percent of the height). The partially filled molds are allowed to rim for a limited time. The molds are then filled from the aluminum-killed portion of the heat in a manner such as to cause good distribution of the added metal throughout the still molten metal in the mold. The resulting ingots are then converted to flat-rolled product by conventional methods.

3,593,775
HEAT TRANSFER MEANS IN INVISCID MELT SPINNING APPARATUS
Wilbur J. Privott, Jr., Raleigh, and Wallace C. Lawrence, Durham, both of, N.C., assignors to Monsanto Company, St. Louis, Mo.
Filed Apr. 11, 1969, Ser. No. 815,428
Int. Cl. B22d *27/02, 11/12*
U.S. Cl. 164—251 **14 Claims**

The severe thermal gradients which are ordinarily present in the base of a crucible employed in high-temperature spinning operations are significantly reduced through utilization of a thermally anisotropic shelf. The bottom surface of the crucible base is positioned substantially parallel with the plane of high thermal conductivity of the shelf and in thermal conduction contact therewith. Concurrently, the crucible extrusion opening and an aperture within the shelf are aligned substantially coaxially. A means is employed for heating the outer periphery regions of the shelf, causing a heat flow toward the aperture. The substantially constant temperature

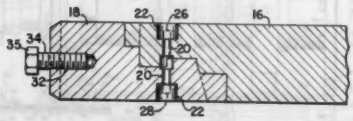
along the thermal plane of the shelf and at the region of the shelf adjacent to the aperture therein preclude the formation of significant lateral thermal gradients which are responsible for fracture of the crucible base. Precipitation buildup near or in the extrusion hole is also significantly reduced by keeping the extrusion hole at least as hot as the surrounding melt.



ERRATUM

For Class 164—274 see:
Patent No. 3,593,792

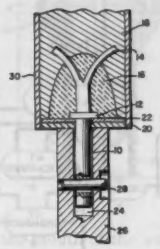
3,593,776
STARTER BAR HAVING A FRANGIBLE COUPLING
Calvin C. Williamson, Costa Mesa, Calif., assignor to Soule Steel Company, San Francisco, Calif.
Filed Oct. 30, 1968, Ser. No. 771,822
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 **4 Claims**



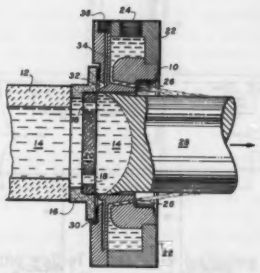
This is a detachable starter bar coupling in which a head member is detachably connected to one end of a continuous casting starter bar. The connection is made by means of a bolt having a reduced section near its midpoint so that the application of a preselected amount of force on the coupling will cause the bolt to break and the head to detach from the starter bar. The head is provided with a projecting bolt at one end thereof which is inserted in the continuous casting mold in order to be embedded within the cast strand as it solidifies.

3,593,777
LEADER FOR INGOT IN CONTINUOUS CASTING
Joseph Pietryka, Paris, France, assignor to Fives Lille-Cail, Paris, France and Konstruktionsburo fur Stahl und Walzworke, Cologne, Germany
Filed July 14, 1969, Ser. No. 841,510
Claims priority, application France, July 17, 1968, 159,450
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 **5 Claims**

The leader for removing an ingot from a mold comprises a head including a readily deformable plate, which closes the bottom of the mold, and a refractory block affixed to the plate and projecting into the mold. The block is friable or readily deformable and has a transverse cross section which is smaller than the interior cross section of the mold.



3,593,778
CONTINUOUS CASTING APPARATUS
John J. Foye, Spokane, Wash., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Mar. 7, 1968, Ser. No. 711,242
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **10 Claims**

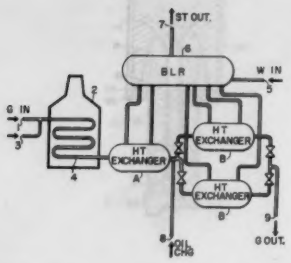


This specification relates to apparatus for continuous casting of molten metal. The apparatus comprises a hollow chilled mold assembly connected to a reservoir for molten metal via an orifice plate assembly. The orifice plate assembly has a perimeter at least equal to the perimeter to the hollow of he mold and is positioned between and contiguous to the chilled mold and the reservoir. The orifice plate assembly has a passageway therein for flow of molten metal from the reservoir into the mold. A substantially heat conductive segment is provided in the orifice plate and is positioned so as to permit heat flow therethrough into a perimetrical section of the mold hollow. Due to the heat flow, solidification of the embryo shell of metal being cast in the mold adjacent to the orifice plate is retarded and the formation of cold shuts in the metal is reduced.

3,593,779
HEAT EXCHANGER FOR QUENCHING THERMALLY CRACKED GAS
Ichiro Tokumitsu, Tokyo; Minoru Sugiyama, Tokyo, and Souji Asano, Yamaguchiken, all of, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan
Filed Aug. 25, 1969, Ser. No. 852,731
Claims priority, application Japan, Sept. 12, 1968, 43/65238
Int. Cl. F28f *27/02*
U.S. Cl. 165—1 **10 Claims**

Quenching of thermally cracked gas of hydrocarbons is carried out by the use of a first stage heat exchanger and one of two or more second stage heat exchangers which are arranged in parallel and connected to the first stage one and

each of which is used alternately after removal of deposited coke, whereby the operation of a thermal cracking furnace



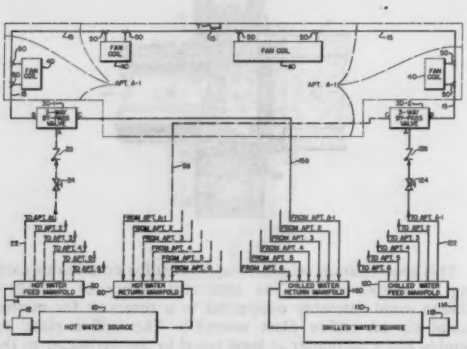
can be carried out continuously for much longer period than ever before.

3,593,780

HEATING AND COOLING SYSTEM

James Patrick Donnelly, 112 Hauerhill St., North Reading, Mass.

Filed May 7, 1969, Ser. No. 822,601
Int. Cl. F24f *3/00*
U.S. Cl. 165—22 **8 Claims**



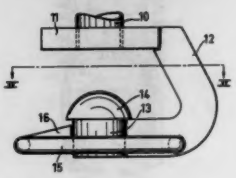
An air-conditioning system for multiple zone building units, including heating and cooling, in which the delivery of a heated or chilled liquid heat exchange medium (water) to heat exchange units (fan coils) in each zone to be conditioned, is individually controlled by a thermostat in each such zone, and which includes a single pipe closed distribution system for each individually controlled zone for circulating the heated or chilled water, to each zone separately and alternatively and in opposite directions through its single pipe closed distribution system, a heater adapted to supply heated water to the closed distribution system of each individually controlled zone, a chiller adapted to supply chilled water to the closed distribution system of each individually controlled zone, and valve means in the closed distribution system in each zone for controlling the supply of heated water to the closed distribution system in each zone, and for returning it to the heater, and for controlling the supply of chilled water to the closed distribution system in each zone, and for returning it to the chiller, the supply of such heated and chilled water to the closed distribution system in each zone being separately and alternatively controlled by the thermostat in each controlled zone.

3,593,781

DISTRIBUTING ARRANGEMENT FOR SHOT-FED SOOT CLEANING SYSTEMS

Borje Fransman, 4 Ljungvagen, Sollentuna, and Per Thorson, 38 Fyrverkarbacken, Stockholm, both of, Sweden

Filed Nov. 7, 1969, Ser. No. 874,942
Claims priority, application Sweden, Nov. 8, 1968, 15,175/68
Int. Cl. F28g *13/00*
U.S. Cl. 165—95 **3 Claims**



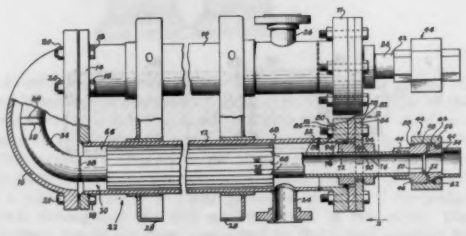
The present invention relates to the cleaning of gas-swept beating surfaces in heat exchanging apparatus by the scouring action of cleaning particles, such as steel shot, which are scattered over the heating surfaces by a distributing member from which the cleaning particles rebound. The invention provides, in combination with a distributing member as already known in the art an annulus-shaped distributing element disposed below the said distributing member and substantially concentrically thereto. By this arrangement a more uniform distribution of the cleaning particles is attained, particularly when the intensity of cleaning is great, i.e. cleaning particles are cycled at a high rate through the heat exchanging apparatus.

3,593,782

HEAT EXCHANGER

John G. Draves, Dunkirk; Maurice R. Garrison, Hamburg, and Edward J. Skiba, Williamsville, all of, N.Y., assignors to American Precision Industries Inc., Buffalo, N.Y.

Filed Sept. 8, 1969, Ser. No. 855,857
Int. Cl. F28f *9/26*
U.S. Cl. 165—143 **9 Claims**



A heat exchanger having a shell with a closure flange and an inner tube with an adapter having a peripheral sealing surface. The shell has an inner beveled sealing surface and a seal ring is pressed against the peripheral sealing surface and the beveled sealing surface by a compression ring carried by the shell flange. A retaining ring also carried by the shell flange extends into a peripheral groove in the adapter to limit axial movement between the inner tube and the shell.

3,593,783

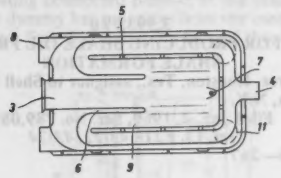
HEAT EXCHANGER FOR MOTOR VEHICLE HEATERS

Gerhard Muller, Esslingen, and Fritz Mohring, Nellingen, both of, Germany, assignors to J. Eberspacher, Esslingen, Neckar, Germany

Filed July 12, 1968, Ser. No. 744,427
Claims priority, application Germany, July 15, 1967, E 34397 Ia/17f
Int. Cl. F28d *7/02*
U.S. Cl. 165—164 **7 Claims**

A heat exchanger for motor vehicle heater comprises two mating outer half shells and two mating inner half shells, the

outer and inner half shells preferably being integral with each other. The shells are formed with stamped mating half ducts which, when the half shells are assembled in mating relation,



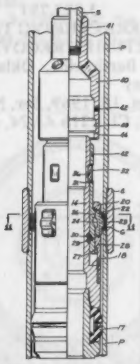
define respective separated flow paths for a heating medium and for a fluid heat exchange medium. The half shells may be stamped to conjointly define a combustion chamber on the axis of symmetry.

3,593,784

ANCHOR ASSEMBLY FOR WELL TOOLS SUCH AS PACKERS AND THE LIKE

Cicero C. Brown, and Chudleigh B. Cochran, both of Houston, Tex., assignors to Brown Oil Tools, Inc., Houston, Tex., by said Cochran

Filed Sept. 11, 1969, Ser. No. 857,047
Int. Cl. E21b *23/02*
U.S. Cl. 166—125 14 Claims



An anchor assembly for anchoring well tools such as packers and the like, inside a pipe string adapted particularly for running on a wore line tool string. The assembly includes safety latch means arranged to provide assurance against premature or accidental release of the assembly from the running string while being run but which is readily releasable upon actuation of the anchor elements.

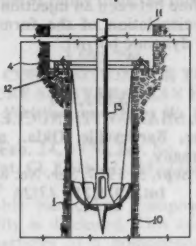
3,593,785

SEISMIC DRILL HOLE RING PLUG

Peppino Bassani, 14248 Laurier Drive, Edmonton, Alberta, Canada

Filed Dec. 8, 1969, Ser. No. 882,850
Claims priority, application Canada, Nov. 6, 1969, 066,900
Int. Cl. F21b *33/12*
U.S. Cl. 166—202 7 Claims

There is disclosed a means for use in plugging a well including a flexible plug member which can adapt itself to different diameters of well, and a suspension means for hanging



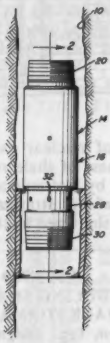
the plug member in the mouth of the well whereby concrete may be poured into the mouth of the well to provide a plug.

3,593,786

JET WALL CLEANER

Farral F. Lewis, 170 Adger St., Shreveport, La.

Filed Sept. 10, 1969, Ser. No. 856,632
Int. Cl. F21b *21/00*
U.S. Cl. 166—222 5 Claims



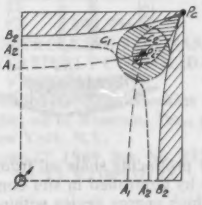
A cleaner for the wall of a well bore including a short full bore tube with a plurality of angulated jet orifices directing a high velocity stream of fluid against the wall of the well bore to effectively clean the wall. A sleeve is slidably mounted on the tube for closing the jet orifices with a locking device securing the sleeve in closed position and a shear pin holding the sleeve in open position until closed by a cement tap plug.

3,593,787

INTERFACE ADVANCE CONTROL IN SECONDARY RECOVERY PROGRAM BY USE OF GRADIENT BARRIER

Donald L. Hoyt, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 24, 1968, Ser. No. 786,568
Int. Cl. E21b *43/20, 43/22*
U.S. Cl. 166—245 23 Claims



The advance of the interface between driving and driven fluids in a secondary recovery operation toward a production

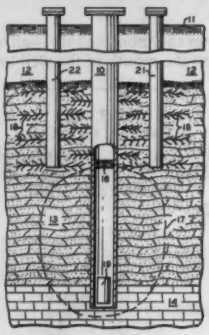
well is delayed by the imposition of a gradient barrier of produced hydrocarbon fluids injected into the formation via a control well in line between an injection well and a production well, the recirculation of the formation hydrocarbon fluids providing a dynamic barrier.

3,593,788

CRUSHING OIL SHALE WITH NUCLEAR EXPLOSIVES

Harry W. Parker, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 5, 1967, Ser. No. 665,529
Int. Cl. E21b *43/26*
U.S. Cl. 166—247 **5 Claims**



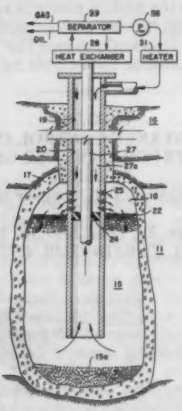
The effectiveness of nuclear explosions in an oil shale stratum to create a mass of shale rubble, suitable for in situ retorting, is increased by hydraulically fracturing prior to the explosion a portion of the stratum above the level of the stratum which will be shattered by the explosion.

3,593,789

METHOD FOR PRODUCING SHALE OIL FROM AN OIL SHALE FORMATION

Michael Prats, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 18, 1968, Ser. No. 768,666
Int. Cl. E21b *43/24, 43/26*
U.S. Cl. 166—259 **11 Claims**



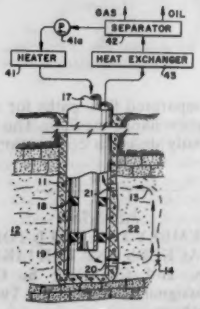
A method for producing shale oil from a subterranean oil shale formation by controlled in situ combustion by exploding a relatively high energy device within an oil shale formation thereby forming a fragmented vertically extensive zone of rubble having a substantially void space at the top thereof. The zone is filled with a layer of granular material for permeability adjustment and a controlled combustion front is initiated by injecting a fluid comprising a mixture of oxygen-containing gas and aqueous liquid substantially near the top of the granular-filled fragmented zone so as to advance a combustion front down the zone and produce oil shale pyrolysis products.

3,593,790

METHOD FOR PRODUCING SHALE OIL FROM AN OIL SHALE FORMATION

John A. Herce, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Jan. 2, 1969, Ser. No. 789,089
Int. Cl. E21b *43/22, 43/24*
U.S. Cl. 166—267 **6 Claims**



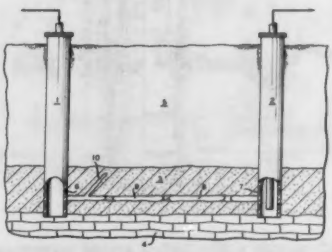
A method for producing shale oil from a permeable zone formed within a subterranean oil shale formation by circulating through a well borehole in contact with said permeable zone a fluid containing at least one phenolic compound.

3,593,791

HORIZONTAL FRACTURING TECHNIQUES FOR BITUMEN RECOVERY

Harry W. Parker, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 15, 1969, Ser. No. 858,038
Int. Cl. E21b *43/24, 43/25*
U.S. Cl. 166—271 **7 Claims**



A method is disclosed for forming a subterranean horizontal fracture while minimizing the formation of subterranean vertical fractures by employing a fracturing fluid having a specific gravity greater than the specific gravity of that stratum through which the horizontal fracture is to be formed.

3,593,792

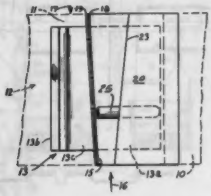
DUMMY BAR FOR CONTINUOUS CASTING

Walter Hess, Dusseldorf, and Horst Grothe, Kaarst, both of, Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed June 11, 1968, Ser. No. 736,095
Claims priority, application Germany, June 14, 1967, Sch 40,884
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 **5 Claims**

This dummy bar is adapted to be connected in axial end-to-end relation to a continuous casting and to be separated

therefrom by moving the dummy bar and casting relatively in opposite directions approximately at right angles to an axial line through the connection from the dummy bar to the casting. The end face of the dummy bar which is to be adjacent to the casting is slanted at an acute angle to the directions in which the adjacent ends are separated so as to slant outward toward a casting connected thereto, in the relative direction in which the dummy bar separates from the casting. An insert is slidable in a first slot across the face of the dummy bar in



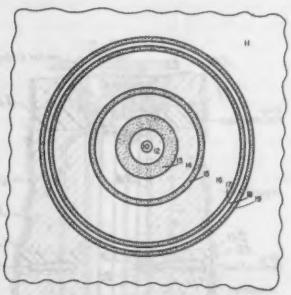
the relative direction in which the dummy bar moves for the separation, and is normally held therein by a shear pin arranged substantially at right angles to the directions of separation and is adapted to shear at a pressure exceeding a predetermined pressure applied for separating the dummy bar and casting. The connection is made by a connecting member having one end adapted to be embedded in the casting and another end slidably received in a second slot which is across the insert in the relative direction in which pressure applies to the dummy bar for the separation.

3,593,793

STIMULATION OF RECOVERY FROM UNDERGROUND DEPOSITS

Ray M. Kelseaux, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Feb. 3, 1969, Ser. No. 796,230
Int. Cl. E21b *43/26*
U.S. Cl. 166—280 **20 Claims**



Chemically stable liquid reactants capable of forming an explosive reaction mixture are injected into a fluid or mineral bearing formation, which may first be hydraulically fractured. An inert spacing medium is injected intermediate to the injection of the reactants so that the explosive mixture is formed at some desired radial distance from the wellbore. The reactants may be such that the explosive mixture autodetonates with the passage of time or may be detonated by shock, as by the detonation of a conventional detonating device. The reactants may also be injected in cycles, each cycle comprising the reactants separated by a slug of inert spacing medium. The amount of spacer may be varied during the treating operation, as by decreasing the amount of spacing medium during the operation, so that the explosive reaction mixtures are formed in concentric regions of the formation surrounding the wellbore. The first reactant may be used as a hydraulic fracturing fluid, and contain conventional and/or shock-sensitive explosive propping agents. Upon detonation of the explosive reaction mixtures, the formation is fractured in a radial manner with the resulting fractures propagated both outward into the formation and inward toward the wellbore so as to enhance the subsequent recovery of minerals or fluids from the formation.

3,593,794

METHOD AND COMPOSITION FOR TREATING LOW-TEMPERATURE SUBTERRANEAN FORMATIONS

Paul W. Fischer, Whittier, and John W. Scheffel, Fullerton, both of, Calif.

Filed Feb. 24, 1970, Ser. No. 13,864
Int. Cl. E21b *33/138, 43/26*
U.S. Cl. 166—283 **19 Claims**

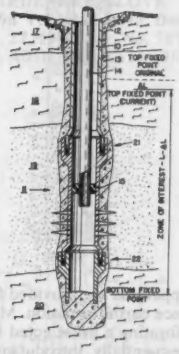
A water-insoluble particulate composition having controlled oil solubility is disclosed. This composition is comprised of solid particles of a homogenous mixture of (1) about 10 to 13 weight percent of an ethylene-vinyl acetate copolymer that contains about 23 to 30 weight percent vinyl acetate and exhibits a melt index of about 300 to 500 grams per 10 minutes and (2) a paraffin wax that contains at least 70 weight percent hydrocarbons having 25 to 32 carbon atoms per molecule. Also, a process employing this particulate composition in drilling wells into low-temperature subterranean formations, and in fracturing and treating such formations, is disclosed.

3,593,795

METHOD AND APPARATUS FOR DRILLING AND PRODUCING WELLS IN A FORMATION SUSCEPTIBLE TO COMPACTION

Leo P. Broussard, Sr., New Orleans, La., assignor to Shell Oil Company, New York, N.Y.

Filed May 19, 1969, Ser. No. 828,093
Int. Cl. E21b *33/14*; **F16l** *27/12*
U.S. Cl. 166—285 **7 Claims**



Apparatus and method for completing a well in a subterranean oil-bearing formation wherein the well is adapted to traverse an area susceptible to compaction. A well is drilled and casing is installed in the well. The casing is provided with expansion joint means so as to prevent buckling of the casing when any compaction occurs in the area susceptible to compaction. The casing is then firmly fixed in position in the well.

3,593,796

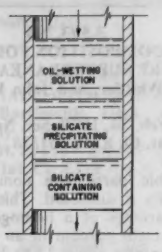
METHOD OF CONTROLLING FINE SAND PARTICLES WITHIN A RELATIVELY CONSOLIDATED SAND FORMATION

Morgan Ashley Stainback; Evan Hoskins Street, Jr., and Robert Noel Tuttle, all of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed June 27, 1969, Ser. No. 837,181
Int. Cl. E21b *33/138*
U.S. Cl. 166—288 **8 Claims**

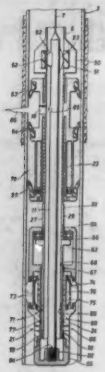
A method of controlling movement or displacement of fine sand grain particles within a relatively consolidated sand formation by successive injections of (1) an aqueous solution containing a silicate adapted to wet the fine sand, (2) a sil-

icate-precipitating agent adapted to effect solidification of the silicates and (3) an oil-wetting agent so as to hold the



sand grain particles in situ during subsequent fluid flow through the formation.

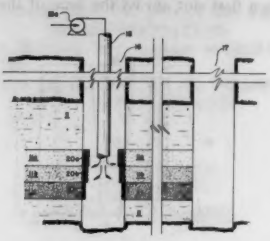
3,593,797
METHOD AND APPARATUS FOR CONSOLIDATING A SUBSURFACE EARTH FORMATION
Maurice P. Lebourg, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.J.
Filed May 16, 1969, Ser. No. 825,314
Int. Cl. E21b *33/138*
U.S. Cl. 166—290 **29 Claims**



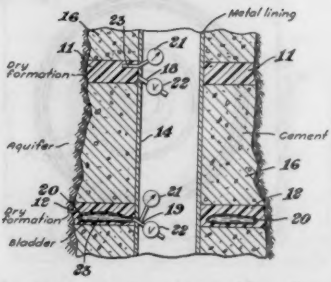
Methods and apparatus are provided for treating an unconsolidated subsurface earth formation. Means are provided for isolating and perforating a preselected section of a wellbore, and thereafter sequentially introducing selected formation treating agents into the perforated formation. After these materials are in the formation, a suitable temporary plugging agent is deposited in the perforation, to prevent its collapse, as well as to block the entrance of wellbore fluids. In the apparatus, the plugging agent is held in the annulus defined by a pair of spaced-apart elastomeric packing cups, and the equipment is merely shifted to position the cups above and below the perforation to enable the plugging agent to flow into the perforated formation. The apparatus preferably includes provision for a closeable bypass around the plugging agent held between the cups, whereby the apparatus may be moved up or down a fluid-filled casing without disturbing the plugging agent.

3,593,798
METHOD OF REDUCING THE PERMEABILITY OF A THIEF ZONE
Henry C. H. Darley, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed May 9, 1969, Ser. No. 823,393
Int. Cl. E21b *33/138*
U.S. Cl. 166—295 **4 Claims**

A method for obtaining a flat injection profile for a fluid, such as a drive fluid used in an oil recovery operation, that is being injected into an interval of earth formation of nonuniform permeability by contacting the most permeable portions of the interval with a slurry containing a mixture of flexible solid fibers and a fiber-bonding agent, such as sodium silicate or a polyepoxide. An agent to precipitate or gel the bonding agent is then injected.

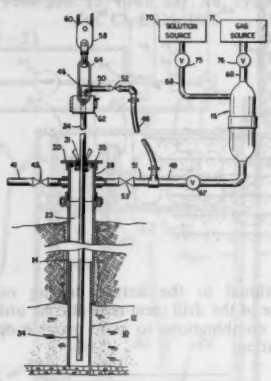


3,593,799
METHOD OF SEALING A SPACE WITH A HYDROPHILIC SOLID GEL
Lowell D. Boughton; Samuel A. Pence, Jr.; Duane L. Stude, and Clare H. Kucera, all of Tulsa, Okla., assignors to The Dow Chemcial Company, Midland, Mich.
Filed July 29, 1969, Ser. No. 845,838
Int. Cl. E04b *1/16;* **E21b** *33/14;* **E21d** *5/012*
U.S. Cl. 166—295 **3 Claims**



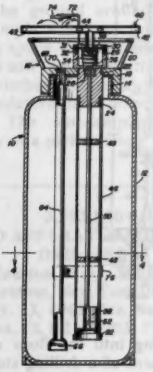
A technique is provided for forming watertight enclosed seals against solid surfaces in which sealing pressure is regulated in a moisture containing environment. The sealing materials utilized are hydrophilic solid gels prepared from water soluble polymers in a suitable solvent medium. Pressure on sealing interfaces is regulated by venting the enclosed mass of solid gel. In a preferred embodiment, a bladder containing a readily flowable liquid is incorporated into the solid gel. Venting of the bladder uniformly adjusts pressure throughout the entire seal. Optionally, means may be provided for continuous pressure readings in the solid gel.

3,593,800
APPARATUS FOR MAKING PREFORMED FOAM FOR USE IN WELLS
Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Aug. 25, 1969, Ser. No. 852,857
Int. Cl. E21b *21/00*; E21c *7/06*
U.S. Cl. 166—312 4 Claims



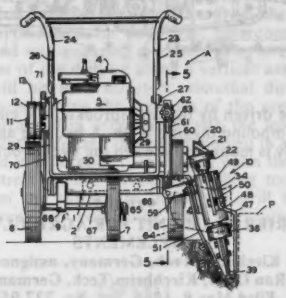
A foam generator for use in mixing gas and a foamable solution to preform a foam for use as a circulating fluid in a well.

3,593,801
FLUID-ACTUATED FIRE EXTINGUISHER
Joseph S. De Palma, 109 Carlson Court, Closter, N.J.
Continuation-in-part of application Ser. No. 746,978, July 23, 1968. This application Nov. 26, 1969, Ser. No. 880,183
Int. Cl. A62c *35/02*
U.S. Cl. 169—27 5 Claims



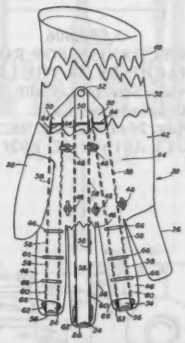
A portable automatic fire extinguisher having a tubular member mounted exteriorly of the extinguisher housing and containing a fluid that expands significantly in response to an abnormal ambient temperature condition. A bellows is surrounded by the fluid and is displaced during fluid expansion. A push rod is connected to the bellows at a first end of the rod while the opposite end mounts a valve. When the bellows is displaced, the push rod is similarly moved thus causing the valve to open and free a stored reagent for mixing with a second reagent which results in the formation of a fire-extinguishing liquid. A discharge tube is disposed in the extinguisher housing and has a nozzle end extending outwardly from the housing so that the extinguishing fluid can be discharged omnidirectionally.

3,593,802
EDGING APPARATUS
William De Lange, Jr., 2523 S. Prospect St., Springfield, Mo.
Filed Jan. 24, 1969, Ser. No. 793,728
Int. Cl. A01b *45/00*
U.S. Cl. 172—15 8 Claims



An apparatus for edging or troughing a surface, such as the ground along a walkway, the apparatus including a supporting frame resting upon wheels and mounting a motor that interconnects through drive means to operate a cutter blade assembly, the blade of the assembly being disposed for rotation around a substantially vertical axis; the axis of rotation of said blade being changeable through adjustment of a bracket mounting the assembly to the frame, and the depth of penetration of said blade being controlled through regulatory means mounting the rearmost wheel to the supporting frame.

3,5 93,803
GARDENER'S GLOVE
Charles W. Ibach, 7198 Versailles Road, Derby, N.Y.
Filed Dec. 27, 1968, Ser. No. 787,365
Int. Cl. A01b *1/00*; A41d *19/00*
U.S. Cl. 172—370 6 Claims

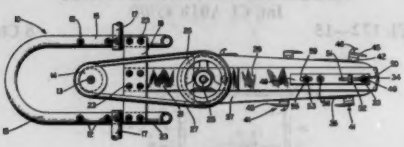


A gardener's glove formed of a thin, flexible tough material having finger members and an elongated sleeve. Tool elements are associated with one or more finger members and may be formed integral therewith or otherwise secured thereto. The tool elements extend beyond the tips of the finger members and are curved away therefrom toward the palm to form work engaging portions. Tool means in the form of claws can be provided adjacent the ends of the tool elements remote from the work engaging portions.

3,593,804
POWER CULTIVATOR
Roy S. Snider, 3950 Burke Ave. N.E., Louisville, Ohio
Filed Mar. 24, 1967, Ser. No. 625,699
Int. Cl. A01b *35/28*
U.S. Cl. 172—100 1 Claim

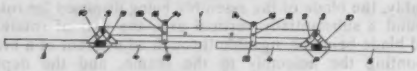
A portable power operated cultivating and digging machine preferably incorporating a gasoline engine as the

prime mover. The engine drives a pulley and belt assembly which in turn drives a sprocket. An endless chain and second



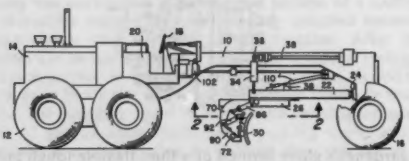
sprocket are driven by the first sprocket, the chain carrying a series of compound digging teeth. A backing and chain bearing assembly is mounted between the two sprockets.

3,593,805
CARRIER BEAM UNIT FOR AGRICULTURAL IMPLEMENTS
Willy Rau, Kirchheim/Teck, Germany, assignor to Maschinenfabrik Rau OHG, Kirchheim/Teck, Germany
Filed May 9, 1968, Ser. No. 727,958
Int. Cl. A01b *15/14*
U.S. Cl. 172—776 **14 Claims**



A carrier beam for carrying and loading agricultural implements and having a great length extending transverse to the direction of travel of a tractor to which it is connected is divided into several parts which are rigidly connected to each other in the working position so as to have a maximum working length and the outer parts of which may be pivoted toward each other to reduce this length at least to a size not exceeding the maximum width of a vehicle permitted to travel on a public road.

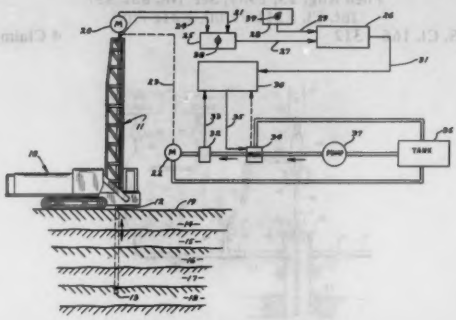
3,593,806
CLAMPING MECHANISM FOR ROAD BUILDING MACHINES OR THE LIKE
Raymond A. Gurries, San Jose, Calif., assignor to Gurries Manufacturing Co., San Jose, Calif.
Filed Aug. 25, 1969, Ser. No. 852,990
Int. Cl. A01b *35/22;* **E02f** *3/76*
U.S. Cl. 172—741 **4 Claims**



Hydraulic clamping mechanisms automatically operative in response to the completion of adjustment of the circle and supported blade or moldboard of a road grader to rigidly clamp such structures in their adjusted positions so as to reduce wear and consequent inaccuracies in operation.

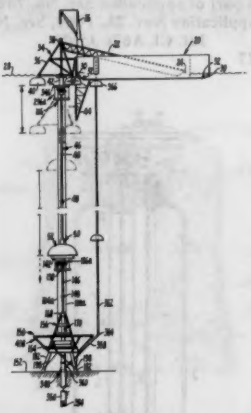
3,593,807
DRILLING APPARATUS
Frank J. Klima, P.O. Box 581, Virginia, Minn.
Filed Dec. 11, 1969, Ser. No. 884,276
Int. Cl. E21b *3/02*
U.S. Cl. 173—6 **10 Claims**

A control system for hole-drilling equipment in which a rotary drill bit and stem is rotated at a predetermined speed and the downward force exerted upon the rotary drill bit is controlled in accordance with a signal derived from the torque required to rotate the drill stem at a constant speed and a signal proportional to a desired drilling rate. Further



signals proportional to the actual drilling rate and the penetration rate of the drill stem may also be utilized in relative adjustable combinations so as to provide optimum efficiency of operation.

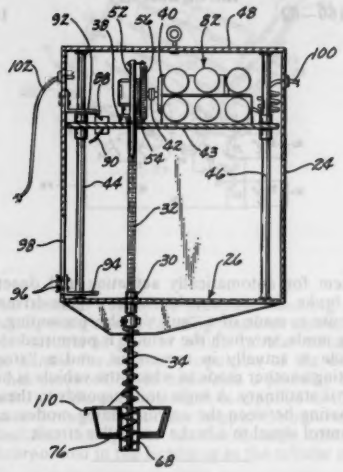
3,593,808
APPARATUS AND METHOD FOR DRILLING UNDERWATER
Arthur J. Nelson, 1998 Broadway, San Francisco, Calif.
Filed Jan. 7, 1969, Ser. No. 789,494
Int. Cl. E21b *3/04, 7/12*
U.S. Cl. 175—6 **37 Claims**



A system for drilling into the floor of a body of water through the employment of a drilling station located on the floor and having a torque imparting mechanism submerged therewith to transmit drilling torque to a drill string extending through the station. In deep water environments, the drill string of the system is suspended from a buoyant support station submerged within the body of water above the drilling station and an untorqued drilling fluid conduit extends upwardly from communication with the drill string to a control station proximate the surface of the body of water. The support station is lowerable to provide for lowering of the drill string as drilling takes place. The control station is buoyant and the conduit is suspended therefrom. Control devices are provided to maintain the respective stations in substantially vertically aligned interrelationship and, thus, maintain the composite length of the drill string and conduit in a relatively straight condition. A service station at the surface of the body of water is provided to selectively add length to or take

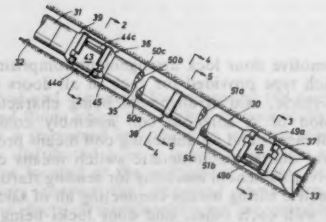
length from the drilling fluid conduit and the mechanism is provided to similarly vary the distance between the support and control stations to accommodate different composite lengths of the conduit.

3,593,809
SOIL SAMPLER DEVICE
William Chester Derry, Bayard, Iowa 50029
Filed Jan. 15, 1969, Ser. No. 791,425
Int. Cl. E21b *3/02*
U.S. Cl. 175—51 **13 Claims**



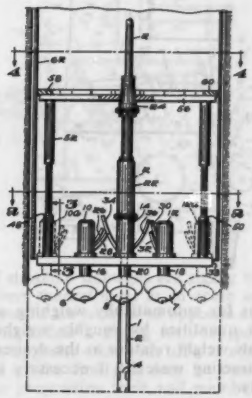
A device having an auger shaft connected to a frame. A motor platform is mounted on the threaded shaft and moves therewith while supporting a finger-shaped soil-sampling receptacle embracing the auger portion of the auger shaft. The soil-sampling receptacle is maintained in yieldable engagement against the ground around the auger shaft and receives the soil sample which moves through a sleeve extending through the space between the finger-shaped receptacle whereupon the soil sample empties downwardly into the receptacle. Limit switches are provided to stop the operation of the unit at predetermined points in its upward and downward travel. The soil-sampling unit is adjustably mounted on the side of a pickup truck and is powered by the truck battery.

3,593,810
METHODS AND APPARATUS FOR DIRECTIONAL DRILLING
Roger Q. Fields, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Oct. 13, 1969, Ser. No. 865,884
Int. Cl. E21b *7/08, 7/04*
U.S. Cl. 175—61 **37 Claims**



In each of the several embodiments of the apparatus of the invention disclosed herein, a new and improved tool carrying a drill bit is dependently coupled from a drill string and lowered into a borehole which is to be excavated in a desired direction. First and second sets of wall-engaging members are operatively arranged around the tool in such a manner that as the weight of the rotating tool is successively supported by each of the first members, commensurate outwardly directed forces will be successively imposed on each of the second members for urging the drill bit in a desired lateral direction. Various controls adapted for operation from the surface of the earth are disclosed for selectively interconnecting the first and second wall-engaging members so as to either maintain the course of the drill bit along a vertical axis or else to direct the drill bit in a selected azimuthal direction and inclination. In practicing the methods of the present invention, a tool arranged in accordance with the invention and having a drill bit connected thereto is coupled in a drill string and positioned in a borehole. Depending upon the particular tool, the controls on the directional drilling tool are then regulated from the surface to direct the drill bit along a selected source for continuing the excavation of the borehole.

3,593,811
APPARATUS FOR DRILLING LARGE DIAMETER HOLES
Jack V. Tedrow, c/o U.S. Army Terrestrial Science Center, P.O. Box 1601, Fairbanks, Alaska
Division of Ser. No. 812,165, Apr. 1, 1969. Filed Apr. 16, 1970, Ser. No. 29,192
Int. Cl. E21b *3/08, 7/00, 11/00*
U.S. Cl. 175—91 **8 Claims**

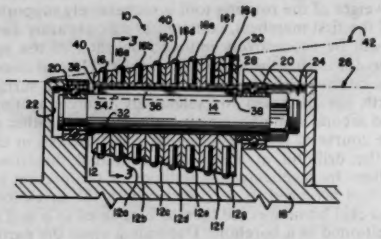


Drilling of large diameter holes in the earth devices accomplished by means of a plurality of small drilling devices which move along a traversing bar to drill a number of small contiguous holes, said bar being rotatable about an anchored pilot shaft to complete the cylindrical cut, the force required to cut into the earth being provided by the weight of the hole casing which is borne by the traversing bar and by pressure exerted against the pilot shaft.

3,593,812
MEANS FOR CUTTING ROCK
Carl R. Peterson, Princeton, N.J., assignor to Lawrence Manufacturing Company, Seattle, Wash.
Filed Jan. 27, 1969, Ser. No. 794,022
Int. Cl. E21b *9/10*
U.S. Cl. 175—354 **14 Claims**

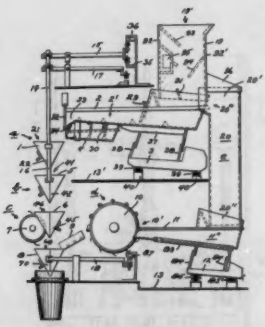
A rock cutter formed of a stack of juxtapositioned cutter discs, said discs each having projecting carbide bits and being mounted on a rotatable shaft for rotation therewith. All bits

have a common mounting plane, but extend therefrom in a graduated progression—from disc to disc. Also, each disc has



its own distinct proportions, being of only a graduated different size compared to a disc to either side thereof.

3,593,813
AUTOMATIC WEIGHING APPARATUS
Shigeru Kitaba; Shigeru Matsui, and Kiyoaki Nakahara, all of Kyoto-shi, Japan, assignors to Kabushiki Kaisha Ishada Koki Seisakusyo, Kyoto-shi, Japan
Filed Dec. 27, 1968, Ser. No. 787,429
Claims priority, application Japan, May 24, 1968, Sept. 11, 1968, Oct. 4, 1968, 43/35410;43/65733;43/72634
Int. Cl. G01g *13/04*
U.S. Cl. 177—82 **12 Claims**

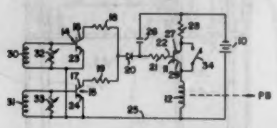


An apparatus for automatically weighing out material in desired weight quantities by roughly weighing a portion, gauging it for its weight relation to the desired quantity and adding or subtracting material if necessary to achieve the desired quantity.

3,593,814
SUPPORT AND RUNNING WHEELS FOR SNOWMOBILES
Fred W. Bauler, 6833 Creston Road, Minneapolis, Minn.
Filed May 21, 1969, Ser. No. 826,312
Int. Cl. B62m *27/00*
U.S. Cl. 180—5 **2 Claims**

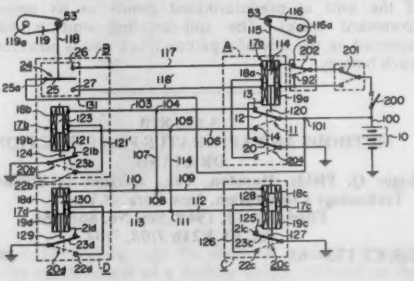
A running wheel for a vehicle having a steerable ski support runner, the running wheel being mounted adjacent the upper surface of the ski support runner, and extending through the ski for a distance adequate to provide running support; the running wheel having a beveled circumferential edge surface providing a relatively sharp ground surface-engaging edge.

3,593,815
SYSTEM FOR AUTOMATICALLY OPERATING PARKING BRAKE FOR AUTOMOBILES
Kiyoshi Inoue, No. 16-8 3-chome, Kamiyoga, Setagaya-ku, Tokyo, Japan
Filed Oct. 7, 1968, Ser. No. 765,540
Int. Cl. B60t *7/12*
U.S. Cl. 180—82 **10 Claims**



A system for automatically actuating and deactuating a parking brake for an acceleratable engine-driven vehicle whereby use is made of a "go" signal representing a vehicle operating mode, in which the vehicle is permitted to move or the vehicle is actually in movement, and a "stop" signal representing another mode in which the vehicle is brought to a stop or is stationary. A logic unit responds to these signals, discriminating between the corresponding modes, and transmits a control signal to a brake controller circuit.

3,593,816
AUTOMOTIVE DOOR LOCK
Kenichi Kazaoka, Kariya-shi, Japan, assignor to Aisin Seiki Company Limited, Kariya-shi, Aichi-ken, Japan
Filed Dec. 30, 1968, Ser. No. 787,439
Int. Cl. E05b *65/42, 65/36*
U.S. Cl. 180—113 **3 Claims**



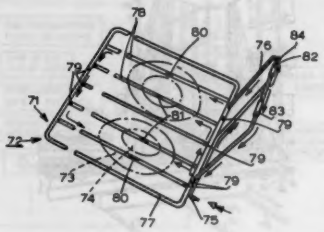
An automotive door lock arrangement comprising a door lock of latch type provided for each of all doors of an automotive vehicle, said arrangement being characterized by the provision of: a solenoid coil assembly comprising a locking coil means and an unlocking coil means provided for each of said doors, an automatic switch means connected with the driver's solenoid assembly for sensing starting of said vehicle, electric wiring means connecting all of said solenoid assemblies with each other, said door locks being actuated thereby into their locking position when the driver's locking coil means is energized for locking by receiving an electrical signal depending upon said energization.

3,593,817

AIR CUSHION LOAD-SUPPORTING DEVICES

Clive A. F. Hawkins, Yeovil, Somerset, England, assignor to British Hovercraft Corporation Limited, Yeovil, Somerset, England

Filed Jan. 13, 1969, Ser. No. 790,719
Claims priority, application Great Britain, Nov. 11, 1968, 55452/68
Int. Cl. B60v *1/00, 1/18*
U.S. Cl. 180—121 1 Claim



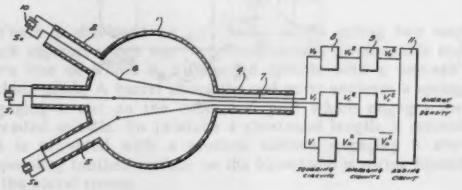
In an air cushion supported materials handling device of the type comprising a load-carrying platform carried by tubular support structure, part of which tubular structure also forms the handle for manual propulsion of the device, the platform has mounted on its underside a plurality of inflatable air pads, and the pressurized air is supplied to the inflatable air pads through the tubular support structure, and can be supplied also through the handle. Suitable control valves can be incorporated in the handle or in the tubular structure.

3,593,818

METHOD AND APPARATUS FOR ENERGY DENSITY MEASUREMENTS IN STANDING ULTRASONIC WAVE FIELDS

Reimar Pohlmann, Im Johannistal 33, 51 Aachen, and Joachim Herbertz, Roermonder Strasse 2, 5105 Laurensberg, both of, Germany

Filed Aug. 20, 1969, Ser. No. 851,691
Claims priority, application Germany, Jan. 22, 1969, P 19 02 907.3
Int. Cl. G10k *13/00*
U.S. Cl. 181—.5 ED 19 Claims



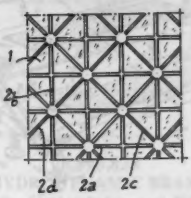
A method and apparatus for measuring the energy density in confined fluids which are excited ultrasonically. A spherical probe is immersed into the fluid with ultrasonic sensors uniformly distributed over a spherical surface, so that the sensors are located at the vertices of regular polyhedrons. The sensors convert the measured parameters into corresponding electrical signals which are processed by squaring and averaging to provide an indication of the energy density. The sensors are imbedded within a substance having a substantially high capacity for sonic absorption.

3,593,819

ACOUSTIC SOUND-ATTENUATING PANELS

Andre Giraudeau, Montmorency (Val d'Oise), France, assignor to Les Isolants Francais, Souge le Genelon Sarthe, France, a part interest to

Filed Oct. 30, 1968, Ser. No. 771,742
Claims priority, application France, Nov. 7, 1967, 3,406
Int. Cl. E04b *1/86*
U.S. Cl. 181—33 2 Claims



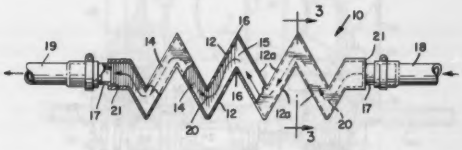
A sound-attenuating panel includes a base and at least one set of upstanding parallel fins. Another set of fins extend perpendicularly to the one set.

3,593,820

PIPELIKE MUFFLER WITH ZIGZAG SHAPE

Horace A. Wright, Immokalee, Fla., assignor to William H. Doub, Immokalee, Fla., a part interest

Filed Apr. 30, 1970, Ser. No. 033,362
Int. Cl. F01n *1/08*
U.S. Cl. 181—70 5 Claims



One pair of straplike sidewalls are zigzag bent so that flat sidewall members thereof meet at an acute angle. A second pair of flat sidewalls are secured to opposite edges of the first pair of walls to define a zigzag tortuous passage which is equipped at its opposite ends with tubular adapters. The zigzag bent walls of the first pair may be compressed or extended so as to preposition their wall members at a selected acute angle before the second pair of sidewalls are secured thereto.

3,593,821

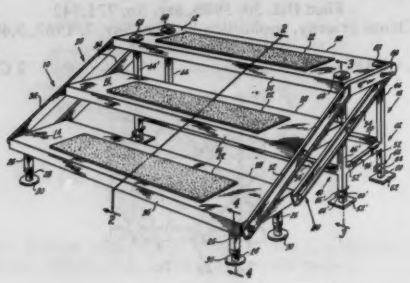
ADJUSTABLE STAIRSTEP UNIT

Glenn F. Lister, Waterloo, Iowa, assignor to Unit Step Farm Company, Inc., Waterloo, Iowa

Filed Dec. 22, 1969, Ser. No. 887,191
Int. Cl. E06c *1/383*
U.S. Cl. 182—115 10 Claims

A stairstep unit which may be temporary or permanent with a top platform tread detachably mounted to a vertically adjustable base that may also be horizontally adjusted to accommodate platform extension panels. A plurality of treads in parallel stepped relationship are movably associated by appropriate linkage with the top platform tread so that for a predetermined number of treads, the vertical distance between the top surfaces of adjacent treads, which is known as the riser height, and an appropriate tread width can be adjusted within prescribed limits for adapting the stairstep unit to varying height conditions between ground level and floor level in the location in which the steps are to be used. Vertically adjustable supports are provided for the bottom tread and the entire structure is adaptable for quick assembly and

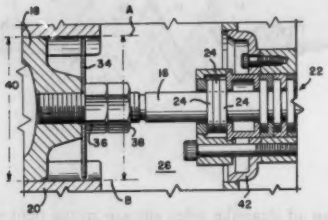
disassembly with major portions being foldable into a knockdown condition for purposes of storage and transportation. An optical railing unit, if used, serves to secure the platform tread to the base.



3,593,822
A LUBRICANT BAFFLE ASSEMBLY FOR RECIPROCATING MEANS

Gordon L. Wilcox, Chateauguay, Quebec, Canada, assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Mar. 17, 1969, Ser. No. 807,663
Int. Cl. F16n *31/02*
U.S. Cl. 184—6 J **4 Claims**



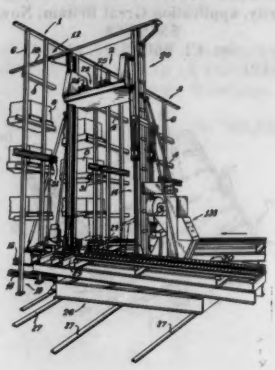
A reciprocating piston rod, drivingly coupled to a lubricated crosshead, the rod having a disclike baffle plate mounted thereon. Lubricant thrown by the crosshead impinges against the baffle plate, and drains therefrom into an adjacent crankcase. The baffle plate is provisioned to interrupt the throw or pitch of the lubricant by the crosshead, both to avoid a lubricant loading or saturation of the piston rod stuffing box, and, consequently, to inhibit introduction of lubricant from the stuffing box into the chamber.

3,593,823
LOAD CARRIERS

Harry W. Thompson, Chicago, Ill., assignor to Interlake Steel Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 737,199, June 14, 1968. This application Oct. 11, 1968, Ser. No. 766,673
Int. Cl. B66b *9/20*
U.S. Cl. 187—11 **16 Claims**

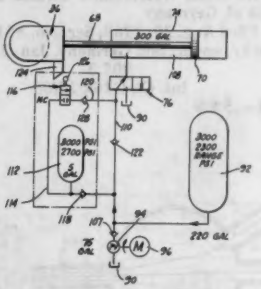
Improved load carriers for transferring articles to and from storage bins including a trolley base having a pair of vertical masts and having a lift platform located between the masts for handling the articles. A hoisting arrangement vertically moves the platform between the masts and includes a plurality of flexible hoist means. A hoist lift motor exerts a substantially equal lift force on each end of the platform through the flexible hoist means, the flexible means being trained about a series of sprockets or wheels arranged at various locations on the load carriers. The reeving arrangement of the flexible members is adjustable and an adjustable guard member is provided to prevent jumping of the flexible members.



3,593,824
VALVE CIRCUIT FOR CONTROLLING THE MOTION OF A DECK EDGE ELEVATOR

Charles E. Gregory, Anchorville, Mich., assignor to Jered Industries, Inc., Troy, Mich.

Filed Apr. 9, 1969, Ser. No. 814,671
Int. Cl. B66b *11/04*
U.S. Cl. 187—26 **8 Claims**



A pressure intensifier valve circuit for controlling the motion of a deck edge elevator on a marine vessel, the elevator including a cable and pulley system for raising and lowering the elevator assembly and a hydrostatic engine for actuating the cable system, a valve mechanism in the circuit controlling pressure distribution to the hydrostatic engine wherein provision is made for instantaneously intensifying the working pressure of the hydrostatic engine when the elevator assembly has reached its uppermost limiting position thus providing an increased peak pressure for stabilizing the platform in a raised, clamping position, the intensified pressure being substantially in excess of the maximum operating pressure normally available during operation of the elevator assembly.

3,593,825

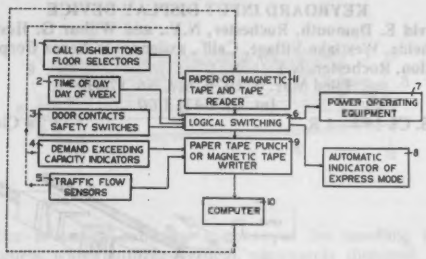
ADAPTIVE CONTROL SYSTEM EMPLOYING A DIGITAL COMPUTER AS A FEEDBACK ELEMENT

Luther Paul Gieseler, 2835 Brook Drive, Falls Church, Va.

Continuation-in-part of application Ser. No. 578,255, Sept. 9, 1966, now abandoned. This application May 13, 1969, Ser. No. 830,569

Int. Cl. B66b *1/20*

U.S. Cl. 187—29 R 8 Claims


CALL PUSHBUTTONS FLOOR SELECTORS
TIME OF DAY DAY OF WEEK
DOOR CONTACTS SAFETY SWITCHES
DEMAND EXCEEDING CAPACITY INDICATORS
TRAFFIC FLOW SENSORS
PAPER OR MAGNETIC TAPE AND TAPE READER
LOGICAL SWITCHING
PAPER TAPE PUNCH OR MAGNETIC TAPE WRITER
COMPUTER
POWER OPERATING EQUIPMENT
AUTOMATIC INDICATOR OF EXPRESS MODE

A control system for operating a transportation system including a plurality of vehicles, such as elevators, is disclosed wherein a history of the past performance of the transportation system is stored. This history is analyzed by a digital computer, and the operating mode of the transportation system is changed in accordance with the analysis in order to optimize the performance of the system.

3,593,826

AUTOMATIC AXIALLY ACTING TWO-WAY SLACK ADJUSTER FOR A RAILWAY VEHICLE BRAKE RIGGING

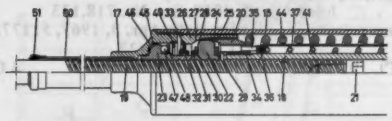
Nils Borje Lennart Sander, Malmo, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Sept. 2, 1969, Ser. No. 854,572

Claims priority, application Great Britain, Sept. 14, 1968, 43835/68

Int. Cl. F16d *65/66*

U.S. Cl. 188—196 D 4 Claims



There is disclosed an automatic axially acting two way slack adjuster which has two telescopically displaceable rod parts one of which is a threaded spindle with a non-self-locking pitch. A barrel about the rod parts encloses a spring engaging a nut on the other rod part which engages the threaded spindle. To produce a shortened length, a second nut is provided with a toothed surface engaging a corresponding toothed surface on the barrel and is spring biased by the barrel spring.

3,593,827

RAILWAY VEHICLE BRAKE RIGGING AND ADJUSTING MEANS

Nils Borje Lennart Sander, Malmo, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

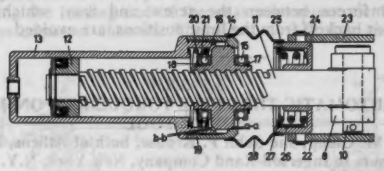
Filed Apr. 1, 1969, Ser. No. 811,942

Claims priority, application Great Britain, Apr. 2, 1968, 15897/68

Int. Cl. F16d *65/66*

U.S. Cl. 188—203 3 Claims

A railway brake rigging has a live brake lever moved by a piston and a dead brake lever pivoted on a fixed position relative to the bogie frame through a linkage coupled to the live brake lever. The fixed position is a movable slack adjuster spindle with a mechanism operable through a linkage to the piston to rotate a nut between two clutch surfaces so that the spindle moves axially to take up or release slack in the rigging.



3,593,828

HYDRODYNAMIC BRAKE

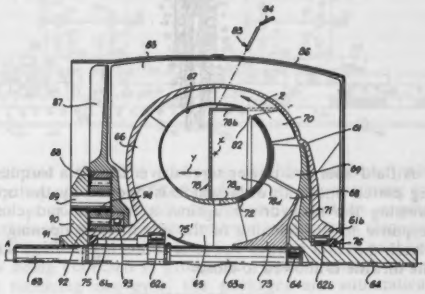
Hans-Christof Klein, Hattersheim, and Wilhelm Kanpp, Bad Homburg vorder Hoehe, both of, Germany, assignors to Alfred Teves G.m.b.H., Frankfurt am Main, Germany

Division of Ser. No. 688,139, Dec. 5, 1967, Pat. No. 3,489,252. Filed Sept. 15, 1969, Ser. No. 857,708

1969, Ser. No. 857,708

Int. Cl. F16d *57/04*

U.S. Cl. 188—274 3 Claims



A hydrodynamic brake connected with the power train or wheels of an automatic vehicle in which confronting rotors are driven in opposite senses and have interleaved arrays of axially extending vanes circulating the hydrodynamic brake fluid along a closed path in heat-transferring relationship with air induced to flow along the outer wall of the pump housing by blowers connected with the rotor shafts. The decelerator effectiveness is controlled by intercepting in a stepless manner the pumped liquid.

3,593,829

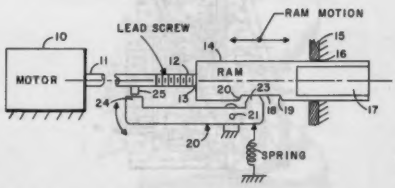
MECHANICAL STOP LIMIT MEANS FOR LEAD SCREW-DRIVEN RAM

Winston F. Williams, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Apr. 3, 1970, Ser. No. 33,420

Int. Cl. F16d *71/00*

U.S. Cl. 192—141 5 Claims



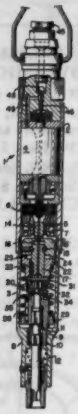
A positive mechanical stop for position limits of a lead-screw-driven ram is provided by a ram-motion-actuated stop

pawl which is pivoted to engageable relationship with a transverse stop pin carried on the lead screw. By stopping lead screw rotation to effect the ram position limits, high frictional forces between the screw and ram, which might prevent backoff from the limit positions, are avoided.

3,593,830
AUTOMATIC THROTTLE TORQUE-RESPONSIVE POWER TOOL

John M. Clapp, and John P. Krouse, both of Athens, Pa., assignors to Ingersoll-Rand Company, New York, N.Y.

Filed May 1, 1969, Ser. No. 820,940
Int. Cl. F16d *43/20*
U.S. Cl. 192—150 14 Claims

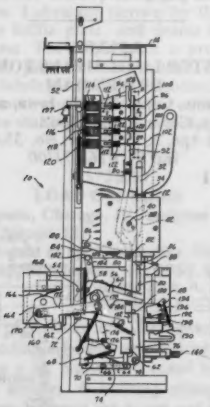


A fluid-operated power screwdriver having a torque-opening clutch and a throttle which is opened by the operator pressing the screwdriver against a fastener and closed in response to the opening of the clutch. The opening of the clutch moves a control sleeve to a locking position whereby the throttle is allowed to close.

3,593,831
WIDE PRICE RANGE CHANGE MAKING COIN MECHANISM

William Rosenhagen, Ossining, N.Y., and Albert Kurimsky, Rockaway, N.J., assignors to Rows International, Inc., Whippany, N.J.

Filed May 20, 1969, Ser. No. 826,091
Int. Cl. G07f *11/00*
U.S. Cl. 194—10 13 Claims

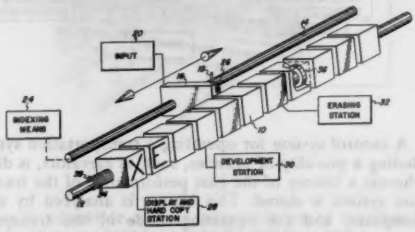


A wide price range, coin mechanism for a merchandising machine in which an electromechanical coin totalizer system responsive to the deposit of coins establishes credit and sets up change making circuits for giving up to four nickels in change over a range of prices from 5 to $1.00 in 5 steps while doing away with base price and price differential cam mechanisms of the prior art in which the range of prices is limited to the narrow range of differentials from the base price.

3,593,832
KEYBOARD INPUT DISPLAY DEVICE

David E. Damouth, Rochester, N.Y., and Wilbur G. Hespenheide, Westlake Village, Calif., assignors to Xerox Corporation, Rochester, N.Y.

Filed Mar. 6, 1970, Ser. No. 17,093
Int. Cl. B41j *3/00*
U.S. Cl. 197—1 R 4 Claims

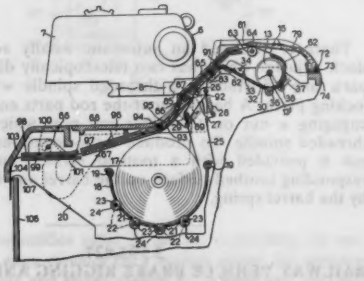


A plurality of multifaceted single character display elements, each of which is independently rotatable to printing, development, display-hard copy, and erasure stations in response to a keyboard input, is disclosed. The use of single character display elements together with resilient spacing means between each element makes possible line justification prior to making a hard copy.

3,593,833
DEVICE FOR SUPPORTING AND GUIDING A ROLL OF PAPER IN A CALCULATING, ACCOUNTING OR LIKE MACHINE

Franco Bretti, Are'di Caluso, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea, Turin, Italy

Filed Apr. 2, 1968, Ser. No. 718,133
Claims priority, application Italy, Apr. 3, 1967, 51177A/67
Int. Cl. B41j *15/22*
U.S. Cl. 197—132 4 Claims



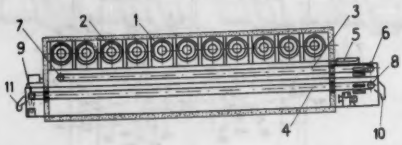
In an accounting machine having an alphanumeric printing mechanism and a numeric printing mechanism the paper carriage for the alphanumeric mechanism is guided by a rail located to the rear of the numeric mechanism. This latter is adapted to print on a tally roll adapted to be housed in a substantially semicylindrical plate located under the guiding rail and provided with a set of parallel apertures for a set of rotatable rollers supporting the tally roll. The paper of the roll is so guided as to pass after printing along a path beneath said guide rail, a slit on the rear wall of said cover being provided for the exit of the printed paper of said roll.

3,593,834

CONVEYOR FOR HANDLING FROZEN PRODUCTS

Zbigniew Zygmunt Klos, and Lech Stanislaw Bialkowski, both of Warsaw, Poland, assignors to Biuro Studiow i Projektow Konstrukcji Stalowych Mostostal, Warsaw, Poland

Filed Oct. 3, 1969, Ser. No. 864,305
Claims priority, application Poland, Oct. 4, 1968, P. 129366
Int. Cl. B65g ; B01f *11/00*
U.S. Cl. 198—1 4 Claims



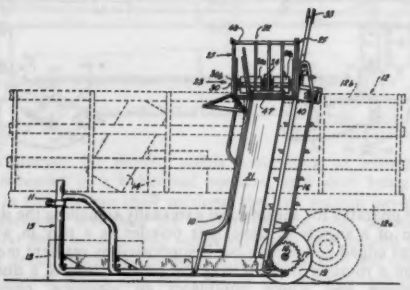
The invention concerns a conveyor for handling food products which utilizes vertical, alternately disposed, stationary and vertically moving bars. The ends of the stationary moving bars are secured to vertical plates which in turn are secured to a Gall-type power transmission chain driven by a gear wheel. The moving bars pass through vertical plates and are received on either side in the slots of guides which are moved in vertical directions by a multiple-lob cam which cam is mounted on the same shaft on which the gear wheel driven by the power transmission chain is mounted.

3,593,835

BALE LOADING MACHINE

Vincent Kneib, and Earl G. Kneib, c/o Kneib Mfg. Co., 6 Highway, both of St. Joseph, Mo.

Filed May 8, 1969, Ser. No. 822,948
Int. Cl. B65b *65/02*; B65g *37/00*
U.S. Cl. 198—7 9 Claims



A field bale-loading machine having an upright mobile frame and an elevating conveyor for elevating bales to a level above an associated vehicle bed and including a bale discharge means connected to the frame and supportable at different angles of inclination with respect to the frame, for receiving bales from the elevating conveyor for laterally transporting bales away from the elevating conveyor and for discharging bales onto the bed.

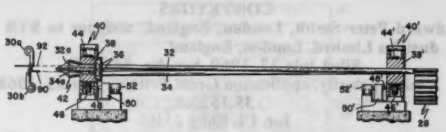
3,593,836

TRANSFER APPARATUS

William J. Hill, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed June 9, 1969, Ser. No. 831,678
Int. Cl. B65g *47/26, 47/52*
U.S. Cl. 198—25 9 Claims

An apparatus for axially receiving and laterally transferring successive elongated elements. A plurality of element receiving channels are mounted for lateral movement across a given path along which the said elements are delivered to the apparatus. Adjustable switch pipes axially deliver one elongated element to one of said channels while simultaneously directing the leading end of the next subsequent element to another adjacent channel. The element receiving channels



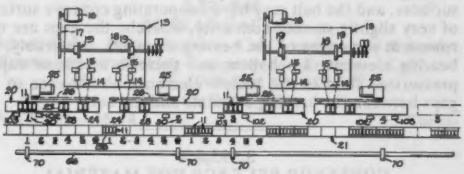
and the switch pipes are intermittently operated to transfer the elongated elements sliding in said channels laterally from the said path while permitting uninterrupted axial movement of at least one elongated element from one of said switch pipes into one of said channels.

3,593,837

PACKAGING MACHINE

Clifford R. Loomis, Jr., Beloit, Wis., assignor to Riegel Paper Corporation

Filed Feb. 6, 1969, Ser. No. 797,104
Int. Cl. B65b *35/30*; B65g *47/52, 57/10*
U.S. Cl. 198—35 3 Claims



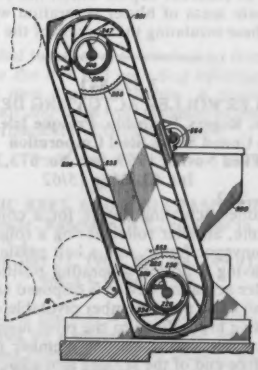
Stationed adjacent a packaging machine with two points for feeding out lines of filled packages are two receiving conveyors positioned end-to-end for movement in opposite directions. One end of each conveyor is adjacent a respective one of the feed-out points for receiving the line of packages. After being collected in groups of a predetermined size on each receiving conveyor, the packages are automatically placed on a transferring conveyor by a transferring mechanism for movement to a cartoner. The transferring mechanisms are located at each receiving conveyor and are activated in sequence with one another and with the movement of the transferring conveyor.

3,593,838

CONVEYOR BELT

Salvatore Latone, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

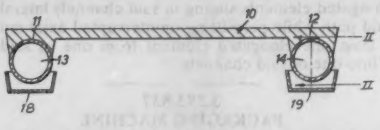
Filed May 24, 1968, Ser. No. 731,898
Int. Cl. B65g *17/12*
U.S. Cl. 198—140 1 Claim



A conveyor belt for vertically lifting particulate material from a lower receiving point and depositing it at a higher

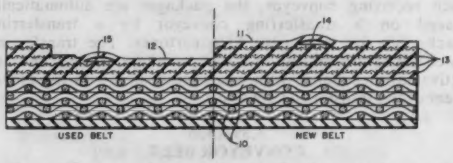
point, both points being located totally within the confines of the belt as are the openings for the buckets that make up the belt.

3,593,839
CONVEYORS
Edward Peter Smith, London, England, assignor to BTR Industries Limited, London, England
Filed July 23, 1969, Ser. No. 844,078
Claims priority, application Great Britain, July 23, 1968, 35,152/68
Int. Cl. B65g *15/60*
U.S. Cl. 198—184 **9 Claims**



A conveyor having a belt and continuous bearing elements near the lateral edges of the belt to support the belt, in which there is means to supply fluid under pressure to the gaps between the bearing elements and the belt to form a fluid bearing for the belt. The bearing elements may have convex surfaces, and the belt may have cooperating concave surfaces of very slightly smaller concavity, whereby the gaps are narrowest at the edges of the bearing elements. Preferably, the bearing elements are hollow and there is means to supply pressurized fluid to the hollow elements, and thence to the gaps between the bearing elements and the belt.

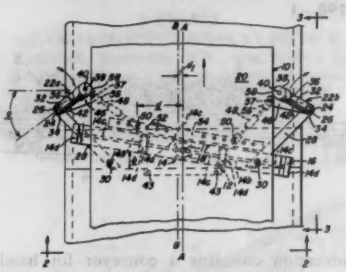
3,593,840
CONVEYOR BELT FOR HOT MATERIAL
Nathan E. Guyer, Stoneham, Mass., assignor to American Biltrite Rubber Co., Inc., Chelsea, Mass.
Filed Apr. 23, 1969, Ser. No. 818,656
Int. Cl. B65g *15/30*; **E06b** *3/12*
U.S. Cl. 198—193 **5 Claims**



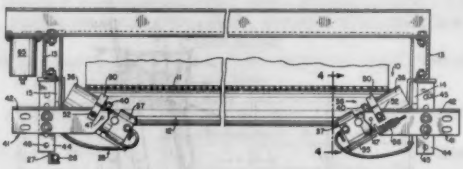
A belt for conveying hot material, comprising a laminated carcass of rubberized fabric and an enclosing cover consisting of thin layers of rubber interleaved and bonded together with fabric plies and thus presenting a plurality of contiguous interfaces all at different depths within the cover itself tending to distribute areas of blister separation where they have the effect of heat-insulating the carcass of the belting.

3,593,841
IDLER ROLLER ACTUATING DEVICE
Carl D. Leow, Rogers Township, Presque Isle County, Mich., assignor to United States Steel Corporation
Filed Nov. 3, 1969, Ser. No. 873,360
Int. Cl. B65g *15/62*
U.S. Cl. 198—202 **35 Claims**

An idler roller actuating device for a conveyor having a conveyor frame, an idler roller having a roller frame pivotable on the conveyor frame, and a belt passing over the idler roller and having a normal operating position is disclosed. The idler roller actuating device is disposed adjacent one side of the belt and has a pivot member pivotable on the conveyor frame; a sensing arm affixed to the pivot member had having a sensing arm free end; a sensing member mounted on the sensing arm free end of the sensing arm adjacent the one side of the belt; a first tension member affixed to the pivot member and having a first tension member free end; and a second tension member affixed to the roller frame and having a second tension member free end pivotably connected to the first tension member free end. The sensing member is engageable with the one side of the belt when the belt moves away from the normal operating position and toward the one side of the belt to rotate the sensing member and the sensing arm in one direction of a counterclockwise direction and a clockwise direction. The first tension member and the second tension member are operable by the rotation of the sensing member and the sensing arm to rotate the roller frame and the idler roller in the other direction of the counterclockwise direction and the clockwise direction so that the idler roller reverses the movement of the belt away from the normal operating position and returns the belt to the normal operating position.



3,593,842
POWDER LEVEL SENSING
Richard C. Berg, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 20, 1969, Ser. No. 867,495
Int. Cl. G08b *21/00*
U.S. Cl. 340—246 **7 Claims**



Apparatus for sensing and externally signalling the diminution of a supply of developer powder in a tray in which a blunt edged conductive bar is supported by resilient members from a rotating shaft to drag the powder toward a discharge opening and which completes an electrical circuit by touching contacts in the bottom wall of the tray upon diminution of the supply of developer powder to close a circuit and externally signal the diminution of the powder.

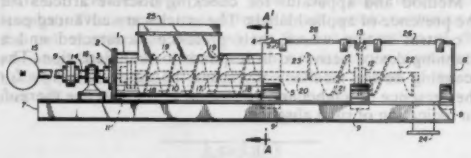
3,593,843
CONVEYING SCREW
Alan Harvey Hill, Darlington, England, assignor to General Engineering Company (Radcliffe) Limited
Filed Mar. 18, 1969, Ser. No. 808,104
Claims priority, application Great Britain, Mar. 21, 1968, 13656/68
Int. Cl. B65g *33/30*
U.S. Cl. 198—213 **6 Claims**

An extruder conveying screw comprising a core having two helical flights thereon, the first of which extends between opposite ends of the screw to define a helical channel and the second of which extends generally across the channel over a portion intermediate the length of the screw, and a casing around said screw characterized in that said second flight is terminated at its upstream end in spaced relationship to the

wall of the first flight and further in that the second flight is provided with a groove across its peripheral surface adjacent and parallel to a line of junction between the first and second

flights at the downstream end of the latter, said groove having a depth such as to provide a clearance of between 0.060 and 0.090 inches between the base of the groove and the casing.

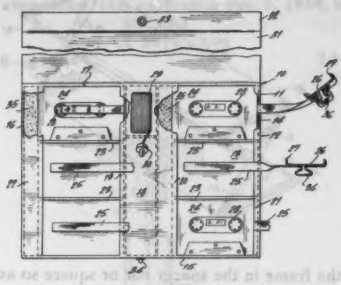
3,593,844
CONVEYOR
John W. Barclay, Green River, Wyo., and Francis R. Evans, Jordan, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.
Filed Oct. 30, 1969, Ser. No. 872,626
Int. Cl. B65g *33/00*
U.S. Cl. 198—214 **10 Claims**



A conveyor for moving solids comprising an elongated shell mounted in a horizontal position, said shell being divided in two distinct shell sections, the first section having a shell diameter less than the second section, inlet means in said first shell section, and outlet means in said second section, a helical flight assembly on a shell rotatably and coaxially mounted within said shell, means for rotating said shaft about its major axis, said flights in the first shell section having a pitch equal to about one-half the diameter of said flight in said first shell section and said flights in the second shell section having a pitch equal to about the diameter of said flight in said second shell section, said first and second shell sections having a flightless section therein on said rotating shaft, said flightless section beginning within said first shell section and continuing into and terminating in said second shell section, said second set of helical flights having its leading edge out of phase of the trailing edge of said first set of helical flights.

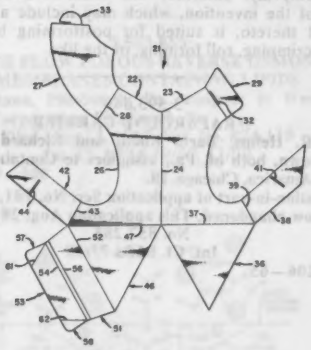
3,593,845
TAPE CASETTE ALBUM
Louis E. Schwartz, New York Law School, 57 Worth St., New York, N.Y.
Filed Aug. 19, 1969, Ser. No. 851,333
Int. Cl. B65d *85/67*
U.S. Cl. 206—1 **5 Claims**

A container for a plurality of audio tape casettes in which a plurality of tape casette-receiving recesses are provided with a resilient wall and an elongated ribbon secured to the bottom of each recess. The ribbon is of a length to extend



part way around the casette and is provided with a clip at the free end thereof to engage and lock the tape casette reels.

3,593,846
DISPLAY CARTON
Michael Dolas, Santa Barbara, Calif., assignor to Recorder Printing and Publishing Company, San Francisco, Calif.
Filed Oct. 27, 1969, Ser. No. 869,607
Int. Cl. B65d *5/50*
U.S. Cl. 206—45.14 **5 Claims**

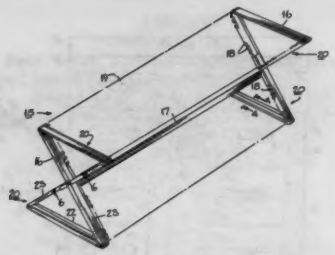


A carton folded together and interlocked from a flat sheet of cardboard or the like and including openings for the display of a sales item disposed therein. A particularly structured folded floor and front wall provides exceptional carton strength and permanency of carton contour.

3,593,847
PILE FABRIC REEL AND END FRAME THEREFOR
Theodore P. Kessler, Rancocas, N.J., assignor to Timron, Inc., Moorestown, N.J.
Filed July 31, 1968, Ser. No. 749,012
Int. Cl. B65d *85/66*
U.S. Cl. 206—51 **23 Claims**

The end frame of the reel is made up of pairs of reel arms which are secured by a centrally located pin. The pin projects from the end frame so as to be slidably mounted in the spacer bar. The hook-containing sections radiate from the pin while the corrugated ribs of each section abut the pin so as to create a rigid structure against bending and skewing.

The reel arms can be made of one piece or of three separate pieces coined together. The pin can be circular so as to



rotate the frame in the spacer bar or square so as to prevent rotation.

3,593,848

FOAM-COVERED COIL AND METHODS OF MANUFACTURING THE SAME

Arthur H. Landau, Katonah, N.Y., assignor to Atlas Coatings Corporation, Long Island City, N.Y.

Filed Feb. 26, 1968, Ser. No. 708,269
Int. Cl. B65h *75/00;* **B32b** *1/00*
U.S. Cl. 206—59 **12 Claims**

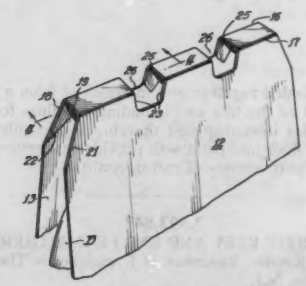
The present invention relates to methods, particularly suited for the coil-coating industry, for continuously covering and permanently bonding a heat stable plastic foam to a metal web traveling at comparatively high speeds of up to 300 feet per minute through coil-baking ovens having ambient atmospheres above 400° F. The metal web may be an unwound coil of steel or aluminum, and the foam may be expanded polyvinyl chloride. The foam-covered metal coil product of the invention, which may include a plastic film laminated thereto, is suited for postforming by stamping, bending, crimping, roll forming, or the like.

3,593,849

WRAPAROUND CARRIER

Charles R. Helms, Barto Road, and Richard T. Walter, Norristown, both of, Pa., assignors to Container Corporation of America, Chicago, Ill.

Continuation-in-part of application Ser. No. 781,005, Dec. 4, 1968, now abandoned. This application Aug. 28, 1969, Ser. No. 857,285
Int. Cl. B65d *75/00*
U.S. Cl. 206—65 **5 Claims**



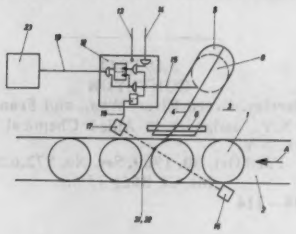
A wraparound carrier formed from a unitary paperboard blank and particularly adapted for the transport of large glass bottles, the carrier consisting of a bottom panel and side panels extending upward therefrom and inclined toward each other to conform generally to the neck portions of the bottles, the side panels being joined by a narrow panel overlying the tops of said bottles, the narrow panel being scored and slit between the ends thereof to provide a pair of finger holes on each side of an intermediate of such necked bottles and to provide confronting gusset folds to reinforce the carrier in the area of said finger holes and to stabilize said intermediate bottles. Desirably, the ends of the narrow and side panels may be scored to define end gusset folds extending toward the endmost of the bottles to hold them against endwise displacement.

3,593,850

DETECTING OF LABELS ON DISCRETE ARTICLES

Josef Denk, Waiblingen, and Otto Ingelfinger, Ludwigsburg, both of, Germany, assignors to Hofliger & Karg, Waiblingen near Stuttgart, Germany

Filed June 4, 1969, Ser. No. 830,327
Claims priority, application Germany, June 8, 1968, P 17 74 394.1
Int. Cl. B07c *5/00*
U.S. Cl. 209—80 **12 Claims**



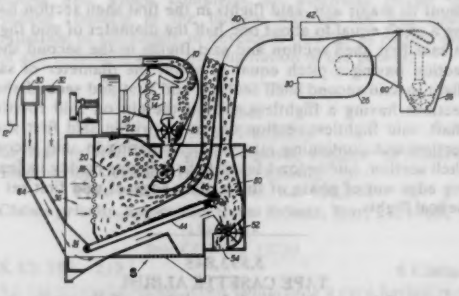
Method and apparatus for checking discrete articles for the presence of applied labels. The articles are advanced past a control station where their presence is detected and a scanning device activated in response to such detection. The scanning device mechanically scans the detected article for the presence of a label and generates, in the absence thereof, an indication of such absence.

3,593,851

TOBACCO LEAF CLASSIFIER

Joseph William Davidson, Richmond, Va., assignor to AMF Incorporated

Continuation of application Ser. No. 760,122, Sept. 12, 1968, now abandoned , which is a continuation of application Ser. No. 535,562, Mar. 18, 1966, now abandoned. This application Sept. 11, 1969, Ser. No. 860,465
Int. Cl. B07b *3/00*
U.S. Cl. 209—133 **3 Claims**



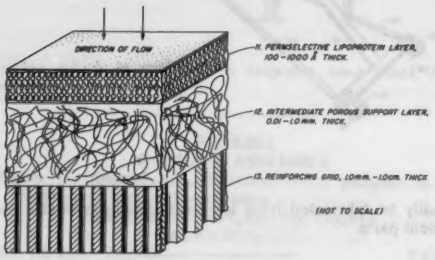
A tobacco leaf classifier including a primary separation chamber and a secondary separation chamber, said secondary chamber receiving middlings from said first chamber and each of said chambers operating in independent air circuits.

3,593,852

REVERSE OSMOTIC WATER PURIFICATION

Lewis Smith Meriwether, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 8, 1969, Ser. No. 848,475
Int. Cl. B01d 39/00, 31/00
U.S. Cl. 210—321 3 Claims


DIRECTION OF FLOW
11. PERMSELECTIVE LIPOPROTEIN LAYER, 100–1000 Å THICK.
12. INTERMEDIATE POROUS SUPPORT LAYER, 0.01–1.0 mm. THICK.
13. REINFORCING GRID, 1.0 mm.–10 cm. THICK
(NOT TO SCALE)

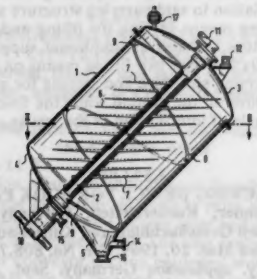
Brackish or saline water may be purified by forcing the water under comparatively high pressure through a reverse osmotic membrane consisting of the reconstituted membranes derived from living cells such as red blood cells, which reconstituted membranes themselves are in the order of 50 to 150 Angstroms thick with at least one and perhaps several layers of such reconstituted membranes supported on a support layer which may be of a water permeable cellulose which in turn is mechanically reinforced by a grid, porous plate or ceramic-type plate which has high mechanical strength. The membrane is formed by ultrasonic rupturing of the cell membranes followed by the reaggregation of the resulting lipoprotein subunits into a continuous membrane having a thickness and composition similar to that of the intact cell membrane but of much greater size.

3,593,853

INCLINED FILTER ASSEMBLY

Hermann Koethke, Hagen, Germany, assignor to H. Putsch & Company

Filed Aug. 26, 1969, Ser. No. 853,024
Claims priority, application Germany, Aug. 26, 1968, P 17 86 168.6
Int. Cl. B01d 29/34, 29/02
U.S. Cl. 210—330 6 Claims



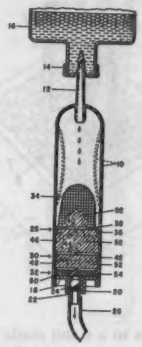
A disc-type filter comprises discs set on a shaft which is inclined to the horizontal. The discs are set obliquely on the shaft.

3,593,854

BLOOD TREATING AND FILTERING APPARATUS

Roy Laver Swank, 4400 S. W. Scholls Ferry Road, Portland, Oreg.

Continuation-in-part of application Ser. No. 826,480, May 21, 1969, now abandoned. This application Dec. 5, 1969, Ser. No. 882,663
Int. Cl. B01d 29/08
U.S. Cl. 210—436 14 Claims



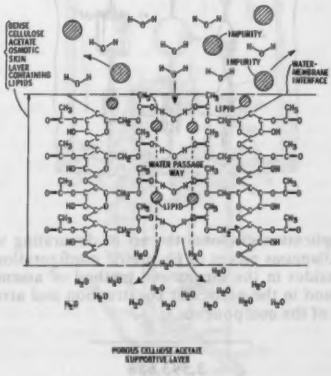
Stored human blood is treated preliminary to blood transfusions by passing it through a mat of glass wool or other fibrous material which removes from the blood the storage-generated platelet leukocyte aggregates present therein. It is filtered during open heart surgery by passing it through the same material for removal of aggregates and leukocytes and separation of entrained air.

3,593,855

HIGH FLOW POROUS REVERSE OSMOSIS MEMBRANES CONTAINING LIPIDS

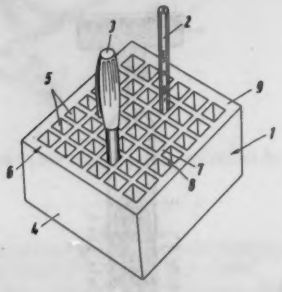
Regis R. Stana, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1969, Ser. No. 824,115
Int. Cl. B01d 39/00, 13/00
U.S. Cl. 210—500 5 Claims



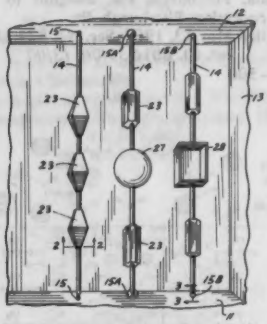
A semipermeable membrane containing a supportive layer and a lipid containing osmotic skin layer of polymeric film forming cellulosic material is made by (1) admixing film forming cellulosic material, solvent, swelling additive and lipid to provide a casting solution (2) casting a film from the solution (3) drying the film (4) leaching the film to form a semipermeable osmotic skin membrane containing a residue of lipid, and (5) optionally curing the membrane.

3,593,856
STAND FOR HOLDING WRITING IMPLEMENTS
Olaf Zander, Haus am Wald, Germany, assignor to Olaf Zander Kommandit-Gesellschaft, Konigstein (Taunus), Germany
Filed Oct. 29, 1969, Ser. No. 872,055
Claims priority, application Germany, Nov. 8, 1968, P 18 07 757.1
Int. Cl. A47f 7/00
U.S. Cl. 211—69.5 1 Claim



The invention relates to a stand made of a ceramic material for holding writing instruments such as pencils or the like. The stand has rows of holes for receiving the instruments and may have a rectangular shape or other shapes. The stand has a large capacity for holding writing instruments despite having a relatively small base area.

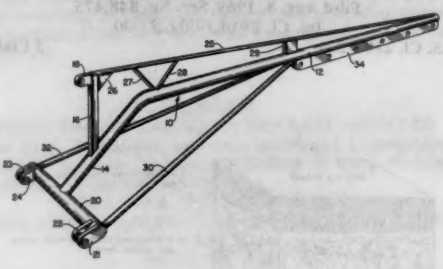
3,593,857
POLE DECORATION
Gordon J. Hernes, 7645 Orchard, Dearborn, Mich.
Filed Nov. 3, 1969, Ser. No. 873,218
Int. Cl. A47f 5/00
U.S. Cl. 211—86 1 Claim



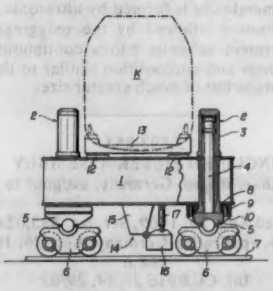
This application discloses the art of decorating with poles and miscellaneous pieces of geometric configuration. The invention resides in the means and method of assembling the elements and in the particular construction and arrangement of certain of the components.

3,593,858
HEAVY DUTY LIFT
Shelton Ruffin, Rte. 1, Oak Grove, La.
Filed Feb. 23, 1968, Ser. No. 707,825
Int. Cl. B66c 23/00
U.S. Cl. 212—8 9 Claims

A lift device for use with farm tractors and similar mechanisms is described. Preferably the lift is used with and attached to the rear of farm tractors equipped both with conventional lifting arms and a conventional remote controlled double-acting hydraulic cylinder. The lift is capable of raising heavy loads to high elevations, is light weight, and can be installed and used by one operator. In addition the lift can readily be fabricated from low cost, readily available component parts.



3,593,859
CONVERTER-CARRYING TRANSFER AND POSITIONING VEHICLE
Ronald Spannlang, Linz-Ebelsberg, and Karl Morhart, Linz, both of, Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria
Filed Feb. 5, 1969, Ser. No. 796,656
Claims priority, application Austria, July 16, 1968, A 6839
Int. Cl. B25j 5/02; B61f 5/00; B65g 63/02
U.S. Cl. 214—1 D 4 Claims

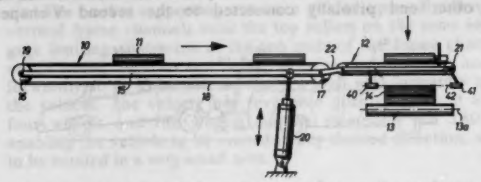


The invention relates to a track-engaging transfer and positioning vehicle for refining vessels enabling a simple transposition at rail crossings. The vehicle of invention comprises a carrying structure having a square ground plan, trucks rotatable in relation to said carrying structure and supporting extensible lifting means serving for lifting and lowering said carrying structure, as well as additional support means arranged centrally between two lifting means on the lower surface of the carrying structure and serving for supporting said carrying structure on the ground while the trucks are rotated through the angle of intersection of the tracks.

3,593,860
STACKING DEVICE FOR BOOK PADS
Hermann Brenner, Kocherstetten, Germany, assignor to Walter Sigloch Grossbuchbinderei, Kunzelsau, Germany
Filed Mar. 20, 1969, Ser. No. 808,730
Claims priority, application Germany, Sept. 7, 1968, P 17 86 261.2
Int. Cl. B65g 57/112
U.S. Cl. 214—6 4 Claims

A device for the stacking of flat books or book pads in which a pivotally mounted conveyor transports the books or pads to an associated, work-actuated unloading mechanism which consecutively drops the books or pads from a constant

height to form a stack of predetermined height on a table or pallet. The conveyor is driven by a piston-cylinder power

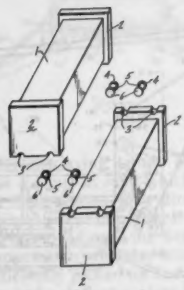


means which is actuated in response to a stack height scanning device.

3,593,861
PACKAGE ASSEMBLY

Walter C. Holland, Jr., Brevard, N.C., assignor to Olin Mathieson Chemical Corporation

Filed Feb. 3, 1969, Ser. No. 795,914
Int. Cl. B65g *1/14*
U.S. Cl. 214—10.5 R **7 Claims**



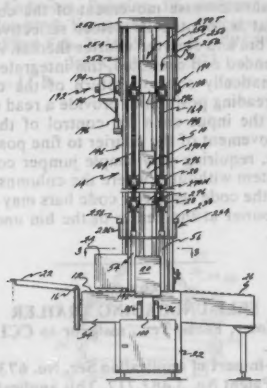
Novel assembly means are provided for aligning and unifying a plurality of similar packages, as of rolls of cellophane. Each package has end sections, which extend somewhat beyond the sidewalls and which have a plurality of suitably shaped notches. Spools, having hub portions adapted to engage the mating surface of the notches, and having flanges at each end adapted to engage end section walls around the notches, firmly retain the assembly together by preventing horizontal movement of the packages relative to each other. A curved or tapered surface is provided on one or both of the mating spool and end support notches in order to facilitate the desired alignment of the packages into a unitary assembly, from which the individual packages are easily and rapidly removable when desired.

3,593,862
INTERFINGERING ENDLESS ELEVATOR AND CONVEYOR APPARATUS

Edward D. Pierson, Denver, and James C. Wright, Arapahoe, both of, Colo., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 27, 1968, Ser. No. 740,553
Int. Cl. B65g *43/00*
U.S. Cl. 214—11 R **19 Claims**

This invention relates to an automatic bundle-elevating apparatus of a type especially adapted to raise newspaper bundles transversely a conveyor at one level and discharge same on a conveyor at another level. The unit includes a specially designed roller conveyor section equipped with a retractable bundle stop that can be inserted into a standard roller conveyor and used to divert bundles to the elevator. Mounted alongside the roller conveyor section immediately ahead of the retractable stop is a pneumatic pusher that cooperates with said stop to square up the bundle preparatory to lifting same free of the conveyor surface. The elevating mechanism comprises a plurality of horizontal, transversely spaced pairs of double-tined arms that move up between the rollers of the conveyor on a sprocket chain and lift the bundle free thereof. As the bundle moves up the elevator, it either passes through or strikes a bail pivotally mounted on the elevator column and extending out over the conveyor section. If the bundle is misaligned to the degree where it strikes the bail, the latter will actuate to shut down the elevator until the condition is

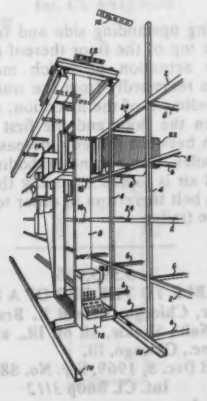


remedied. At least one, and usually several, locations on the elevator column, a discharge station is provided that is equipped with a pneumatic pusher operative upon actuation to push the bundle off of the arms supporting same and onto a second elevated roller conveyor running past the unit. A safety-gate at the upper extremity of the elevator column will actuate to shut down the unit if a misaligned bundle strikes same or personnel attempt to ride up the elevator.

3,593,863
INTEGRATED CIRCUIT COURIER SYSTEM WITH SLOW REVERSE MOVEMENTS FOR CENTERING AT BIN

Paul M. Kintner, Bayside, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

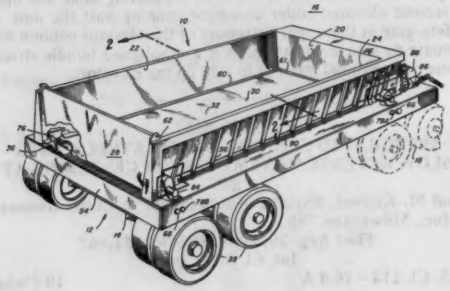
Filed Aug. 20, 1969, Ser. No. 851,667
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 A **10 Claims**



In a warehouse having horizontal rows and vertical columns of bins in which packages are stored by a code-controlled courier, problems of alignment occur particularly when the bin columns are quite high. Horizontal and vertical movements bring the courier in front of a bin and left or right movements of the package supporting table move the

package into or out of left and right bins, respectively. Since horizontal movement is controlled by a single series of code bars mounted along the top or bottom of the bin columns, any misalignment of the bins in a column from the vertical will cause a problem in stopping the courier at the middle of the bin particularly with respect to those bins spaced farthest from such series of code bars. To solve this problem, the code bars are arranged to stop the courier beyond the center of the bin and an integrated circuit logic system automatically causes slow reverse movement of the courier to "fine position," that is, photocells detect reflective tape at the center of the bin and stop the courier thereat. After the table has been extended and retracted, this integrated circuit logic system automatically controls return of the courier to the former code reading position to provide a read code for comparison with the input code for control of the next movement. This movement of the courier to fine position is an optional feature, requiring only simple jumper connections for use of the system without it where the columns are not high. In such case, the code reader or code bars may be positioned to stop the courier at the center of the bin under control of the code bars.

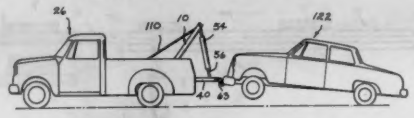
3,593,864
SELF-UNLOADING TRAILER
William H. Moser, Paris, Tex., assignor to CCI Corporation, Tulsa, Okla.
Continuation-in-part of application Ser. No. 673,043, Oct. 5, 1967, now Patent No. 3,482,717. This application Dec. 4, 1969, Ser. No. 881,989
Int. Cl. B60p *1/38*
U.S. Cl. 214—83.36 **3 Claims**



A trailer having upstanding side and front walls includes directly over the top of the floor thereof a first endless conveyor belt, the actuation of which moves the material received thereon rearwardly from the trailer during unloading. In one embodiment of the invention, a second belt is interposed between the floor and the first conveyor belt for reducing friction between thereby increasing the load capabilities of the trailer. In a second embodiment of the invention, pressurized air is forced upwardly through the floor to raise the endless belt therefrom in order to increase the load capabilities of the trailer.

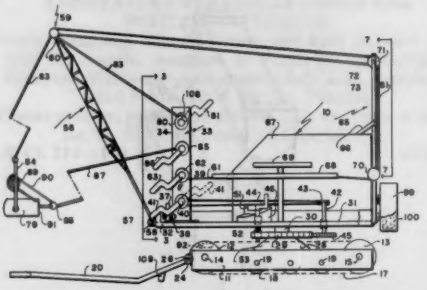
3,593,865
LIFT MOUNTABLE TO THE BED OF A PICK-UP TRUCK
Herman L. Moor, Chicago; Harold R. Braner, River Grove, and Irwin L. Salk, Skokie, all of, Ill., assignors to Braner Engineering, Inc., Chicago, Ill.
Filed Dec. 8, 1969, Ser. No. 882,839
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A **8 Claims**

A lift mountable to the bed of a pickup truck including an inverted V-shaped frame member having leg parts each pivotally connected at the free end thereof to the truck bed adjacent and substantially parallel to the rear edge of the bed so as to be pivotal in a fore and aft direction relative to the truck. A second V-shaped frame member extends rearwardly of the truck over the rear edge of the bed thereof and has leg parts each pivotally connected at the free end thereof to a leg part of the inverted V-shaped member. A hydraulic piston and cylinder power unit has one end pivotally connected to the apex of the inverted V-shaped frame member and its other end pivotally connected to the second V-shaped



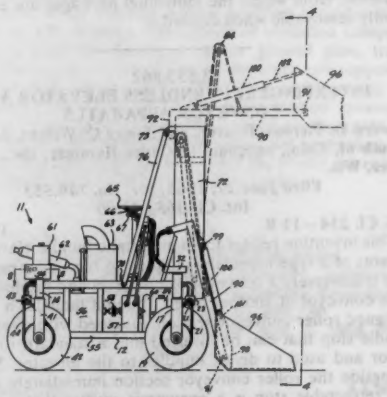
member, adjacent the apex thereof. A tow bar is mounted to the apex of the second V-shaped member. Means are provided for actuating the hydraulic power unit to cause pivotal movement of the second V-shaped member and a shifting of the tow bar.

3,593,866
CARRIAGE MOUNTED SWIVELING TOY CRANE WITH BOLT FOR PREVENTING SWIVELING
Cyril Gazdarica, General Delivery, Tilley, Alberta, Canada
Filed Sept. 15, 1969, Ser. No. 857,878
Int. Cl. B66b *17/00*
U.S. Cl. 214—92 **4 Claims**



A carriage has a boom mounted on a turntable. The boom, bucket and turntable are all operable by foot and hand controls mounted on a common pedestal so that the bucket can be activated, the boom can be raised and lowered, and the turntable can be rotated and locked.

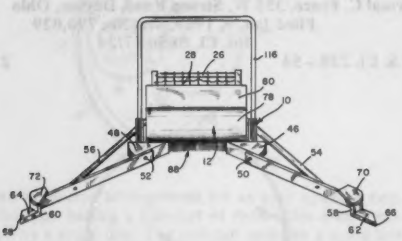
3,593,867
HYDRAULIC LOADER UNIT
Walter W. Moe, 502 S. 12th St., Montevideo, Minn.
Filed Apr. 25, 1969, Ser. No. 819,398
Int. Cl. B66f *9/00*, *9/10*
U.S. Cl. 214—146.5 **16 Claims**



A hydraulic loader vehicle having a liftable front bucket. The vehicle is driven by a gasoline or electric motor which drives a hydraulic pump, which, in turn, delivers pressure fluid to respective hydraulic motors connected to the vehicle

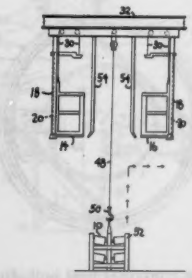
wheels. The pump also delivers pressure fluid to respective front and rear wheel hydraulic motors, and to a hydraulic cylinder employed to raise and lower the bucket of the vehicle. The bucket-supporting arms are guided upwardly along vertical frame channels until the top rollers on t8e arms engage limiting abutments at the top ends of the frame channels, causing the arms and bucket to be swung outwardly and forwardly so as to be able to dump a load well forwardly of the vehicle. The vehicle has reversible positive drive at all four wheels and the wheels can be steered a full 180°, enabling the vehicle to be moved in any desired direction, or to be rotated in a very small area.

3,593,868
TENNIS BALL RETRIEVER
George W. Folz, 124 E. 57th Place, Tulsa, Okla.
Filed Jan. 8, 1969, Ser. No. 789,688
Int. Cl. B60p *3/00*
U.S. Cl. 214—356 **3 Claims**



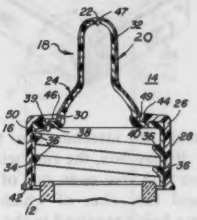
An apparatus for retrieving tennis balls which may be widely scattered on a court or field which comprises a brush element journaled for rotation in a direction whereby the balls are picked up and swept into a receiving chamber as the apparatus is rolled or moved over the field. An arcuate ramp is provided for cooperation with the brush for assuring that the balls will be efficiently picked up and directed toward the receiving chamber, and a deflector plate is provided for moving the balls directly into the receiving chamber in a manner substantially precluding accidental loss of the balls therefrom. In addition, oppositely disposed retriever arm members are provided for dislodging balls from a position adjacent a wall, fence, or the like, and for directing the balls thus dislodged into the path of the brush for sweeping thereof into the storage or receiving chamber.

3,593,869
CRANE APPARATUS WITH HOIST MEANS LOCATED BETWEEN SPACED PLATFORMS
George B. Zurheide, Upper St. Clair, and Frank E. Harvey, Pittsburgh, both of, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Division of Ser. No. 672,211, Oct. 2, 1967, Pat. No. 3,468,434.
Filed Mar. 6, 1969, Ser. No. 804,941
Int. Cl. B65g *47/00*
U.S. Cl. 214—658 **1 Claim**



A crane movable along selected paths and with platforms is used to pull up storage racks on which are stored tubular fiber packages and to convey the racks to twist frames for loading with the packages. The platforms are movable vertically, adjustably and independently to positions for use of handling the packages from the storage rack to the twist frame spindles.

3,593,870
CLOSURE FOR FLUID CONTAINER
Douglas W. Anderson, Palatine, Ill., assignor to Dave Chapman, Goldsmith & Yamasaki, Inc., Chicago, Ill.
Filed Feb. 3, 1969, Ser. No. 795,891
Int. Cl. A61j *11/02*
U.S. Cl. 215—11 B **4 Claims**

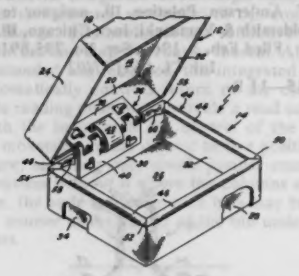


The closure for the liquid container is formed by injection molding a first layer of a hard plastic having first and second inwardly projecting cones, and after it sets, injection molding a second layer of an elastomeric plastic directly against the first layer so that the first layer forms a replaceable cap for the second layer after being removed from the mold. The second layer is molded about a male mold part having screw threads about its shank and a boss abutting the first cone with an elongated crevice adjacent thereto. The screw thread of the second layer deforms to permit the closure to be pulled free from the mold. The crevice and first cone form an elastomeric flap and valve opening comprising a check valve and the second cone forms a liquid outlet.

3,593,871
NURSING BOTTLE WITH DISPOSABLE INSERT
Larry P. Bundy, 866 Stetson Ave., Kent, Wash., and Edward E. McCullough, Box 46, Brigham City, Utah
Filed June 9, 1969, Ser. No. 831,441
Int. Cl. A61j *9/00*
U.S. Cl. 215—11 R **17 Claims**

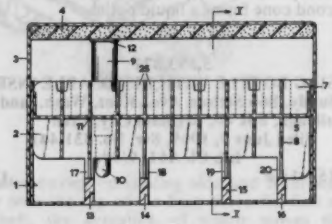
A liquidtight, flexible, disposable container having a nipple surrounded by a flexible flange is supported in a rigid enclosure by clamping the flange thereto. Until used, the flange is folded over the nipple and its edges lightly fastened together to protect the sterile condition thereof.

3,593,872
ORNAMENTAL RIM FOR BOX CONSTRUCTION
Alexander MacDonald, Ayrshire, Scotland, assignor to International Packaging Corporation, Central Falls, R.I.
Filed Nov. 24, 1969, Ser. No. 879,370
Int. Cl. B65d 7/12, 43/16
U.S. Cl. 220—4 R 5 Claims



An ornamental rim for attachment to the walls of the bottom section of a display box, the rim being formed in a one-piece construction with free ends, one of which has a tongue joined thereto and the other of which has a slit formed therein, the tongue being received in the slit for securing the rim on the walls of the box section.

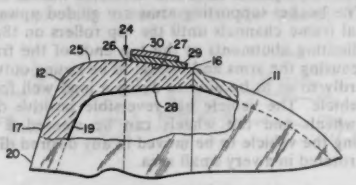
3,593,873
CONTAINER FOR CYLINDRICAL ARTICLES
Johnny Vonk, Hertogenbosch, Netherlands, assignor to Nederlandsche Wapen-en Munitefabr
Filed Sept. 24, 1968, Ser. No. 761,941
Claims priority, application Netherlands, May 22, 1968, 68.0725
Int. Cl. B65d 25/06
U.S. Cl. 220—21 3 Claims



A container for elongated articles such as cartridges, ampullae, and bottles, comprising a box having detachably inserted therein, a partition carrier with holes in at least one of the partitions for receiving the said articles and, if desired, also said carrier being provided with at least two series of abutment means different lengths arranged in such a way as to respectively become effective depending on whether the carrier is inserted into said box with one or the other side thereof forming the bottom of said container.

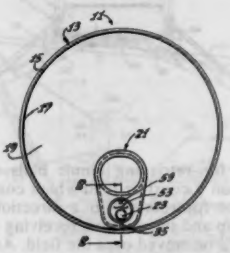
3,593,874
RESISTANT CATHODE-RAY TUBE
Daryl E. Powell, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 23, 1969, Ser. No. 818,747
Int. Cl. H01j 61/30
U.S. Cl. 220—2.1 A 6 Claims

A direct-viewing implosion-resistant cathode-ray television picture tube comprising a glass envelope manufactured from a frustoconical funnel portion and a flanged faceplate portion. An annular reinforcing member closely fitted around the peripheral external surface of the faceplate flange and positioned rearwardly of the mold-match line. The faceplate flange having a thickened portion to compensate for the rear-



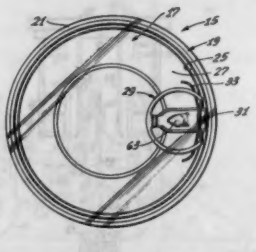
wardly positioned reinforcing member. The thickened portion being placed so as to minimize the reduction of the viewing area of the television picture tube.

3,593,875
TAB FOR TEAR STRIP OF CONTAINER WALL
Ermal C. Fraze, 355 W. Stroop Road, Dayton, Ohio
Filed Jan. 9, 1969, Ser. No. 790,029
Int. Cl. B65d 17/24
U.S. Cl. 220—54 22 Claims



This disclosure describes a tab of sheet material for attachment to an easy-opening container wall. The tab may include a weakened zone positioned to allow limited flexing of the tab to permit raising of the handle end of the tab sufficiently to get the finger between the handle end of the tab and the container wall. The weakened zone is configured and oriented so that the tab has substantial resistance to tearing between the weakened zone and the nose end thereof during use of the tab. The tab has a bead at the nose end thereof which is deformed into a relatively pointed rupturing nose for applying a concentrated force to the container wall.

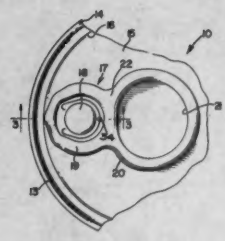
3,593,876
EASY OPENING CONTAINER WALL WITH VENT OPENING
Ermal C. Fraze, 355 W. Stroop Road, Dayton, Ohio
Filed Nov. 6, 1969, Ser. No. 874,622
Int. Cl. B65d 17/24
U.S. Cl. 220—54 15 Claims



An easy opening container wall including a container wall having a line of weakness therein defining a tear portion. The container wall has a rupturable region other than the line of weakness. A tab is attached to the container wall and mova-

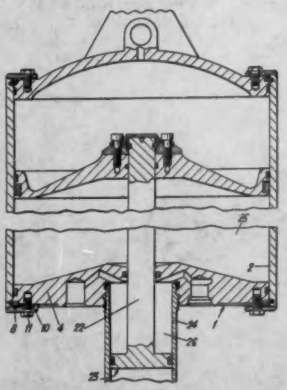
ble to initiate severance of the tear portion. The tab includes a rupturing element which is movable generally toward the rupturable region prior to manipulation of the tab to rupture the rupturable region and form a vent opening in the container wall.

3,593,877
PULL TAB MOUNTING ARRANGEMENT FOR EASY OPENING CAN END
Nick S. Khoury, Worth, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Sept. 29, 1969, Ser. No. 861,650
Int. Cl. B65d 17/24
U.S. Cl. 220—54 3 Claims



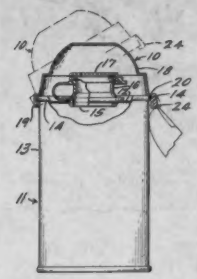
A pull tab mounting arrangement for an easy opening container of the type having a tear-out or removable panel portion defined by a score line. The pull tab includes a score line penetrating nose and is mounted for tilting movement on the removable panel portion about a rivet receiving attaching ear defined by a U-shaped lance. A dimple is formed in the removable panel portion and is disposed within opposing open end slots formed in the attaching ear and tab body on opposite sides of the lance whereby the dimple prevents rotation of the pull tab about the rivet so as to maintain the tab nose aligned with the score line.

3,593,878
CYLINDRICAL PRESSURE VESSEL AND COVER
Siegfried Hertell, Kelsterbach, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Oct. 14, 1969, Ser. No. 866,296
Claims priority, application Germany, Oct. 19, 1968, P 18 04 036.3
Int. Cl. A47j 27/08, 36/10; B65d 45/00
U.S. Cl. 220—55 7 Claims



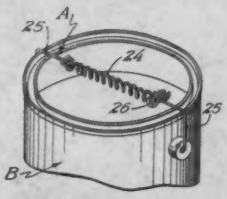
A cover for cylindrical pressure vessels wherein the cylindrical cover having a reduced diameter section at the end extends into the cylinder. A prop ring having a tubular section is positioned between the reduced diameter part of the cover and the cylinder for alignment and support of the cover with respect to the cylinder axis. A radial flange on the prop ring extends into a groove in the cylinder wall to position the cover longitudinally along the axis of the cylinder and prevent the cover from moving outward.

3,593,879
CHILDPROOF COVER FOR A DISPENSING CAN
Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.
Filed Dec. 1, 1969, Ser. No. 881,082
Int. Cl. B65d 43/10
U.S. Cl. 220—60 4 Claims



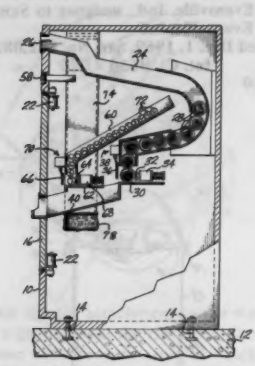
A protective, childproof cover for a dispensing can. The can has an end seam where the top is joined to the sidewall and a dispensing opening in the top. The cover has an inverted cup-shaped body and an annular skirt which fits over the end seam. The inner side of the skirt has an inwardly extending lip of lesser diameter than the seam so that the cover snaps downwardly over the seam. The lip is eccentric relative to the skirt, protruding inwardly a greater distance beneath the seam at one side of the skirt than at the other. There is an annular shoulder joining the cup-shaped body to the skirt which shoulder engages the top of the seam when the cover is in place.

3,593,880
PAINT BRUSH SUPPORTS
John P. Kulbacki, 650 Blair Ave., Saint Paul, Minn.
Filed Oct. 28, 1968, Ser. No. 771,114
Int. Cl. B65d 25/00
U.S. Cl. 220—90 3 Claims



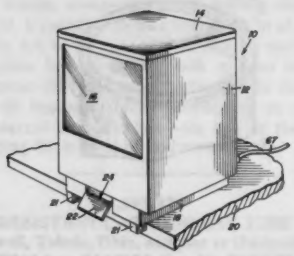
A paint brush support is provided for use with a paint pail having an open top and a pair of diametrically opposed hollow bosses axially apertured to accommodate the hook ends of a substantially semicircular handle. The holder extends across the top of the pail and downwardly along opposite sides thereof, and is provided with hook ends engageable in the hollow bosses. At least the central portion of the holder is preferably a helical spring.

3,593,881
TIME AND MONEY CONTROLLED MONEY VENDING-DEPOSITORY
Alton E. Paap, 4434 S. Eddy, Seattle, Wash.
Filed May 7, 1969, Ser. No. 822,432
Int. Cl. G07f 11/00
U.S. Cl. 221—3 10 Claims



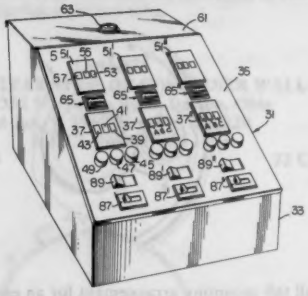
This invention relates to a money vending-depository device which will vend packages of money, as coins in rolls or paper currency in containers, in combination with an integrated alarm means. Merchants may thus maintain a minimum amount of cash in their cash registers to make change in carrying on normal business but will have additional sums available in the currency vending-depository so that said sums can be obtained when needed for unusual business transactions. The device will vend money only in predetermined value amounts and with predetermined intervals between each vending and thus substantial time periods or delay will be required to deliver or vend a substantial amount of currency. Generally, the last thing a robber or larcenist wishes to do is spend a substantial period of time at the scene of the crime. Also, alarms or signal means are associated with structure of this invention so that any operation of the money vending apparatus, not following a predetermined sequence or time delay, will operate such alarms or signal means.

3,593,882
FOOD ARTICLE DISPENSER HAVING SPRING BIASED COVER FOR SINGLE-ARTICLE DISPENSING
Walter H. Rhindress, 64 N. Harbor Drive, Ocean Ridge, Fla.
Filed May 23, 1969, Ser. No. 827,204
Int. Cl. A24f 27/14
U.S. Cl. 221—150 A 4 Claims



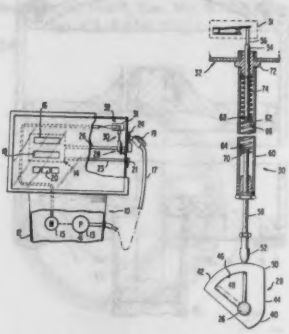
A food dispenser including a circular distributor having radial vanes for storing food articles. The distributor is rotatably fixed to a shaft which is caused to rotate in fixed increments by a solenoid controlled pawl and ratchet assembly. A chute is disposed underneath the distributor so that a single food article positioned between adjacent radial vanes is dispensed to the chute when the article is disposed above the chute opening. A chute cover is freely mounted to the shaft and insures that only one food article is dispensed at a time. A heating assembly is located beneath the distributor which heats the articles in the dispenser.

3,593,883
AUTOMATIC DISPENSING APPARATUS
Elmer A. Robbins, Fort Wayne, Ind., assignor to Tokheim Corporation
Filed Mar. 28, 1969, Ser. No. 811,422
Int. Cl. B67d 5/30
U.S. Cl. 222—16 41 Claims



A gasoline dispensing system comprising a dispenser and a remote console which are operable in several modes, said dispenser comprising registers, zeroizing means pulsing means, "ON-OFF" lever and nozzle; said console comprising a transaction counter, zeroizing means, presettable downcount predeterminer, mode selector and actuator. When selector is set to "predetermine," presetting of the register and operation of the actuator result in zeroizing the counter and enabling of t8e dispenser so that when the lever is turned on, the dispenser resets and then fuel will flow upon opening the nozzle. The console predeterminer and counter are actuated by the pulsing means. With the selector set to "fill-up" the operations are the same except that the dispenser is enabled without presetting. Another console control, when set, enables the dispenser to be operated independently of the console. The attendant is provided with means to suspend dispensing at any time.

3,593,884
FLUID DISPENSING APPARATUS
Bolling H. Sasnett, Jr., 775 Douglas Road N.E., Atlanta, Ga.
Filed Oct. 10, 1968, Ser. No. 766,395
Int. Cl. B67d 5/26
U.S. Cl. 222—35 1 Claim



A gasoline pump is provided with a lost motion cam and a compressible linkage operating between the cam and the pump motor control microswitch so that the shaft carrying

the cam must reach a predetermined operative position before the switch is closed. This prevents malfunctioning of the system. It also protects the microswitch from damage and allows for positive operation of the microswitch by permitting the cam to have a very much larger throw than is required to operate the microswitch.

3,593,885
TORSION DISPENSER FOR DISPENSING FLOWABLE MATERIAL

Glenn C. Wiggins, and John A. Radford, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

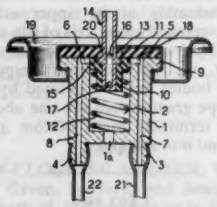
Filed May 2, 1969, Ser. No. 821,261
Int. Cl. B65d *35/28*
U.S. Cl. 222—104 **5 Claims**

A dispenser for controllably dispensing flowable material comprising a tubular pouch containing such material, a hollow cylinder in which the pouch is interiorly mounted, and a spout means associated with the pouch and extending outwardly from the cylinder. The cylinder rotatably carries a part or member such as an end cap which is, in turn, fixedly secured to the pouch. Hand rotation of the end cap twists the pouch and thereby urges the flowable material toward the spout means for dispensing.

3,593,886
VALVE FOR SIMULTANEOUSLY DISPENSING A PLURALITY OF FLUIDS

Bruno Pierre Morane, Paris, France, assignor to L'Oreal, Paris, France

Filed July 8, 1969, Ser. No. 839,842
Claims priority, application France, July 9, 1968, 158,414
Int. Cl. B67d *5/52*
U.S. Cl. 222—136 **6 Claims**

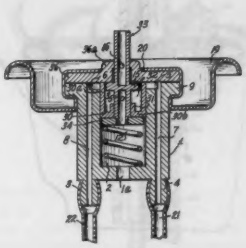


Valve for simultaneously dispensing two pressurized fluids comprising a spout slidable in an annular seal which covers the top of a cylindrical cup. Separate passageways in the walls of the cup lead to separate containers for the fluids and sliding movement of the spout shifts it between a position in which said passageways are blocked and one in which they communicate with the interior of the spout.

3,593,887
VALVE FOR DISPENSING A PLURALITY OF PRODUCTS PACKAGED UNDER PRESSURE

Bruno P. Morane, Paris, France, assignor to L'Oreal, Paris, France

Filed July 25, 1969, Ser. No. 844,840
Claims priority, application France, July 3, 1969, 6,922,462
Int. Cl. B67d *5/52*
U.S. Cl. 222—136 **4 Claims**

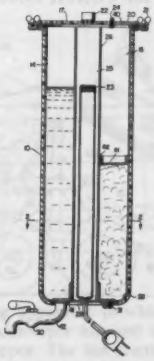


Valve for dispensing at least one of a plurality of fluids and movable between a closed position, an intermediate position releasing only one of said fluids which serves to cleanse the valve, and an open position in which it releases only the other of said fluids. Alternatively, the valve may release both fluids when open.

3,593,888
PORTABLE FOOD DISPENSER

Earl R. Brown, 717 Court St., Utica, N.Y.

Filed June 30, 1969, Ser. No. 837,444
Int. Cl. B67d *5/62*
U.S. Cl. 222—146 **11 Claims**



A portable food dispenser is disclosed with one or more compartments which can hold different foods or beverages about a common temperature regulating section. The products are dispensed by internal pressure through a valve in each compartment and the pressure may be produced from a steam hose or the use of a cylinder of sterile, inert gas.

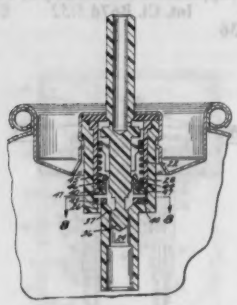
3,593,889
HIGH VOLUME CLEANING AEROSOL DISPENSING VALVE

Samuel B. Prussin, Los Angeles, and Jimmie L. Mason, Hacienda Heights, both of, Calif., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed June 11, 1969, Ser. No. 832,329
Int. Cl. B65d *83/14*
U.S. Cl. 222—148 **11 Claims**

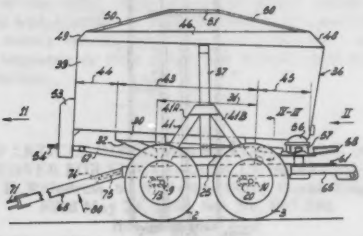
A sequentially operable aerosol dispensing valve whose cycle of operation involves a dispensing cycle followed by a

purging cycle. The valve is provided with a valve means and an operator means, slidably mounted in the bore of a housing. The operator means cooperates with the valve means to open a purging (cleaning) port, after the product dispensing



cycle, for a longer period of time than is possible with existing valves. The longer purging cycle permits a greater volume of purging substance to pass through the valve during this cycle and effects a thorough cleaning o6 the valve in preparation for its next dispensing cycle.

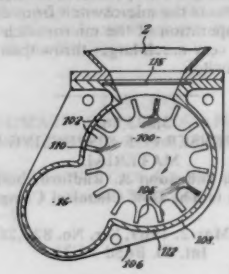
3,593,890
AGRICULTURAL MACHINE WITH SPREADER
Ian Archie MacKinnon, Burlington, Ontario, Canada, assignor to Lely Ltd., Burlington, Ontario, Canada
Filed June 10, 1968, Ser. No. 735,761
Claims priority, application Netherlands, June 16, 1967, Jan. 15, 1968, 67,08369;68,00580
Int. Cl. A01c *19/00*
U.S. Cl. 222—176 **19 Claims**



The invention relates to an agricultural machine having a frame and a supply hopper mounted on the frame. The frame has four ground wheels and a resiliently mounted drawbar which is vertically adjustable relative to the frame. The frame includes a plurality of support beams and struts so that a heavy load can be carried in the hopper. Resilient elements are associated with the ground wheels and frame to absorb shocks when the machine is moved over uneven ground.

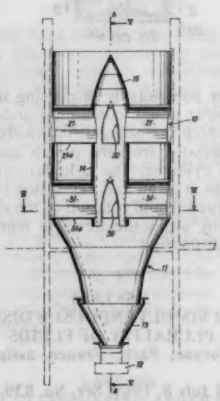
3,593,891
STAR FEEDERS
Archibald Watson Kidd, Seend, Melksham, England, assignor to Archie Kidd (Designs) Limited, Melksham, England
Division of Ser. No. 610,999, Jan. 23, 1967, Pat. No. 3,515,315.
Filed July 30, 1968, Ser. No. 748,774
Int. Cl. B65g *29/00;* **G01f** *11/24*
U.S. Cl. 222—194 **1 Claim**

A star feeder for introducing granular material into an airstream, in which the star wheel rotates in a housing with its teeth on the feed side being clear of the housing wall and



the teeth on the reverse or going up side being in contact with the housing wall to form an air seal.

3,593,892
CONSTRUCTION OF SILOS
Georges Leon Henri Petit, 10 Avenue de Salonique, Paris, France
Filed Feb. 24, 1969, Ser. No. 801,402
Claims priority, application France, Feb. 26, 1968, 141,187
Int. Cl. E04h *7/22;* **B65g** *3/12, 65/70*
U.S. Cl. 222—200 **17 Claims**

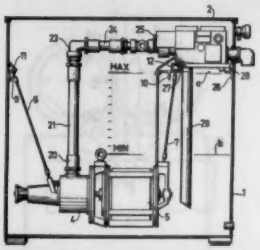


Silo includes interior radially extending hollow bodies each having an ogival cross-sectional shape. Inclination of walls of each body increases from its apex to its base. Interiors of bodies may be accessible from outside the silo. Hollow tubular element, terminating at its upper end in an ogival member, may be arranged along axis of silo and supported by the bodies. Each hollow body may carry an ogival roof capable of movement, e.g. vibration, with respect to the body. The sides of the bodies may be defined by distinct planes, each having a slope greater than the one above it. The tubular element may terminate at its bottom in telescopic elements which extend into a hopper.

3,593,893
PUMP UNIT
Carl Oscar Torsten Montelius, Djursholm, Sweden, assignor to Aktiebolaget Imo-Industri, Stockholm, Sweden
Filed July 24, 1969, Ser. No. 844,395
Int. Cl. F04d *13/02;* **F04c** *15/00*
U.S. Cl. 222—333 **4 Claims**

A pump unit for use in a tank adapted to be filled with a hydraulic fluid to a predetermined fluid level is provided and members suspend the pump and motor assembly in the fluid tank normally below the fluid level. These suspending mem-

bers are attached at spaced points to means carried by the walls of the tank and the attachment means include vibration



dampening members. A valve unit is provided in the tank below a removable tank cover and above the predetermined fluid level for the tank.

3,593,894

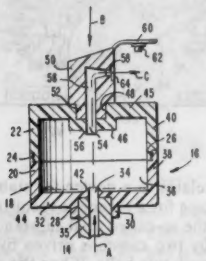
AEROSOL DISPENSER ATTACHMENT FOR INCORPORATING ADDITIVES INTO SPRAY COMPOSITIONS

John James Kehoe, Highland Park; Ralph Spencer Leonard, Berkeley Heights, N.J., and Alexander Livingstone, Washington, D.C., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of application Ser. No. 685,383, Nov. 24, 1967, now abandoned. This application Aug. 13, 1969, Ser. No. 849,931

Int. Cl. B65d *83/06*

U.S. Cl. 222—402.1 **7 Claims**



An adapter for use in combination with an aerosol dispenser containing a first material to be dispensed and having a valve stem. The adapter comprises a container having a lower section provided with a recess therein for receiving the valve stem and an upper section detachably secured to the lower section and having a spray button. A second material to be mixed with the first material is disposed in the container for scenting, coloring, treating, or exothermic reaction with the first material.

3,593,895

NON-CLOGGING AEROSOL VALVE

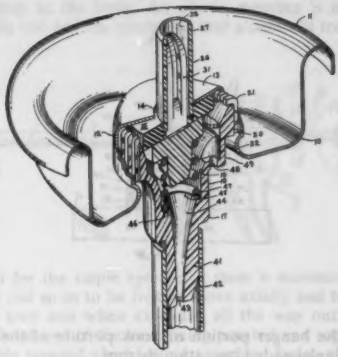
Derek Bernard Green, Bedford, and Joseph L. Clarke, Jr., Manchester, both of, N.H., assignors to Scovill Manufacturing Company, Waterbury, Conn.

Filed Oct. 30, 1968, Ser. No. 782,787

Int. Cl. B65d *5/58*

U.S. Cl. 222—402.24 **4 Claims**

An improved aerosol valve intended to prevent clogging with salt crystals provides a high velocity turbulent flow through the stem with interior channels gradually increasing in size. The stem orifices break through into a rectangular portion of the stem flow passage which is the same width as the orifices. The capillary attraction of residue fluid by the narrowly spaced walls prevent clogging of the orifices. The concept further includes a spring cup or valve housing wherein the material gradually expands from a restricted entrance opening through a long passage which gradually increases in size. There are no sudden expansion points in the flow path which would be likely to result in formation of crystals either in the valve housing or stem.



3,593,896

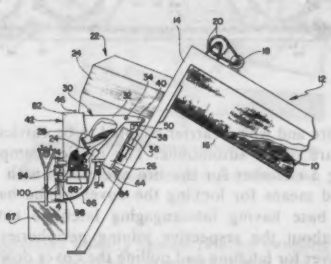
BOBBIN HANDLING APPARATUS

Charles W. Brouwer, East Greenwich; Henry C. Bucheister, Providence, and Raymond V. Tata, Warwick, all of, R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed June 27, 1969, Ser. No. 837,050

Int. Cl. G01f *11/28*; **B67b** *7/24*; **G01g** *13/02*

U.S. Cl. 222—450 **2 Claims**



A bobbin handling apparatus in which filled bobbins are stored in a storage-conveyor bin and discharged through a chute and into a hopper. The bin continues to feed bobbins until a predetermined weight of bobbins is in the hopper whereupon a control system stops operation of the bin and concurrently closes a closure associated with the chute to prevent any bobbins subsequently passing from the bin from entering the weighing hopper. Strands of yarn extending from the bobbins are severed by a cutter mounted on the closure. As a container of an overhead conveyor passes the hopper a sliding trap door of the hopper opens thereby discharging the bobbins in the hopper into the container.

3,593,897

HAND OPERATED TROUSER HANGER

William Bill Knox, 522 N. Harth Ave., Madison, S. Dak.

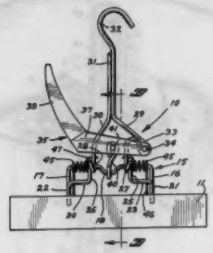
Filed Oct. 29, 1969, Ser. No. 872,218

Int. Cl. A47j *51/14*

U.S. Cl. 223—96 **5 Claims**

A trouser hanger which embodies a pair of shiftable trouser contacting members arranged to contact and hold the cuff of the trousers which members are spring-loaded into normal trouser retaining position with lever means associated

therewith to spread the members apart to receive the trousers therein which lever member is arranged in associa-



tion to the hanger portion or hook portion of the device to permit singlehanded operation thereof.

3,593,898
SPARE TIRE AND WHEEL CARRIER

Paul A. Diforte, 2615 Pelham Ave., Baltimore, Md.

Filed Oct. 16, 1968, Ser. No. 768,078
Int. Cl. B60r *9/04*
U.S. Cl. 224—42.1 **4 Claims**

A spare tire and wheel carrier adapted to be carried on the roof structure of an automobile. The carrier comprising a base having a chamber for the tire and wheel with a cover therefor and means for locking the cover to the base. The cover and base having interengaging latchlike extensions positioned about the respective joining peripheries of the base and cover for latching and pulling the cover down to the base member when the cover is partially rotated and in engaged position with the base member. For positioning the tire and wheel within the chamber of the base in a positive manner the base is provided with an upwardly extending frustoconical shaped structure having bolts and nuts positioned at the top thereof for fastening the tire and wheel to the said structure. The top center of the cone structure is provided with an upwardly extending projection over which the center hole of the wheel is threaded for positioning and centering the tire and wheel to the cone support. The spare tire and wheel carrier having means for fastening the same to the roof structure of an automobile.

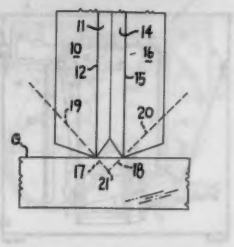
3,593,899
GLASS-SCORING PROCESS

Robert P. DeTorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 732,564, May 28, 1968, abandoned. Filed Oct. 2, 1969, Ser. No. 863,269
Int. Cl. B26f *3/00*
U.S. Cl. 225—2 **2 Claims**

An improved wheel for scoring glass having dual scoring edges spaced in close proximity and a pair of sloping faces intersecting at an angle of 120°.

A process of producing a score in a glass sheet by directing the fissure pressure from a multipoint pressure source and

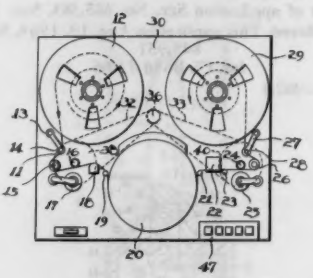


focusing the pressure so as to reinforce the pressure action in a preselected direction.

3,593,900
DEVICE FOR STABILIZING THE OPERATION OF MAGNETIC TAPE

Toshio Doi, Hamamatsu, Japan, assignor to Victor Company of Japan Limited, Yokohama, Japan

Filed June 9, 1969, Ser. No. 831,531
Claims priority, application Japan, June 11, 1968, July 5, 1968, 43/39682;43/46541
Int. Cl. B65h *17/20*
U.S. Cl. 226—51 **10 Claims**



The invention relates to a device for stabilizing the operation of magnetic tape for a magnetic recording and reproducing apparatus, of the so-called dual capstan type. A magnetic tape is operated by two capstans driven by a single capstan motor, acting through two belts. When the rate of rotation of the capstan motor is varied so as to vary the rate of movement of the magnetic tape, pinch rollers are caused to move apart from the respective capstans until the rate of rotation of each capstan is stabilized, whereby loosening of the magnetic tape can be prevented.

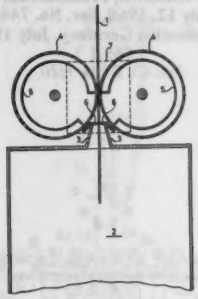
3,593,901
ROLLER-LOCK FOR THE CONTINUOUS TRANSPORTATION OF TEXTILE MATERIALS INTO OR OUT OF AUTOCLAVES

Hans-Ulrich Von der Eltz, Frankfurt am Main; Richard Gross, Munchen, and Albert Reuther, Frankfurt am Main, all of, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed June 20, 1969, Ser. No. 834,958
Claims priority, application Germany, June 25, 1968, P 17 60 732.8
Int. Cl. B65h *17/30*
U.S. Cl. 226—95 **5 Claims**

A roller-lock has been provided for sealing autoclaves during introduction and withdrawal of a textile material in the same. The roller-lock consists of a pair of perforated drums rotated around the axis which form a squeezing slit over the width of the rolls. During operation, the interior of the drum is being evacuated and, if desired, the evacuated gaseous medium reintroduced into the autoclave. The part of the

roller drum under suction may be restricted to be no greater than one quarter of the total surface of the drum. A lip-lock



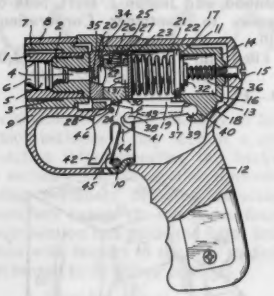
may be placed behind the nip of the drums to improve the sealing. The perforated drums may also be covered with one or more layers of a sieve fabric.

3,593,902

DEVICE FOR NAILING GUN

Erhard Rudolph Boye, Gunnebobruk, Sweden, assignor to Gunnebo Bruks Aktiebolag, Gunnebobruk, Sweden

Filed Dec. 9, 1968, Ser. No. 782,273
Claims priority, application Sweden, Dec. 11, 1967, 16953/67
Int. Cl. B25c *1/14*
U.S. Cl. 227—10 **2 Claims**



A nail-driving gun comprises a bolt mounting the striker pin and retractable jointly with the barrel of the gun relative to the casing of the gun. The striker pin is actuated by pulling the trigger of the gun but is normally held by the bolt in a position in which it cannot be actuated by the trigger. Retraction of the barrel for purpose of driving a nail places the bolt and thus the striker pin into a position in which the pin can be actuated by the trigger. For this purpose, a rigid link bar is hinged at one end to the casing of the gun and at the other end to the trigger. The link bar is positioned opposite to the bolt when the latter is retracted. Pulling of the trigger pivots the link bar into pressure engagement with the bolt thereby displacing the same transverse of the barrel axis into a position in which the striker pin is positioned for effecting firing of the gun by pulling of the trigger.

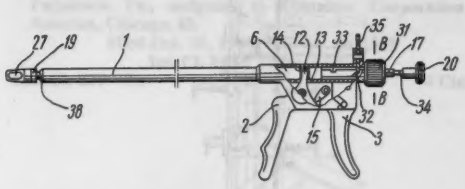
3,593,903

SURGICAL INSTRUMENT FOR SUTURING HOLLOW ORGANS IN INFANTS

Georgy Vasilievich Astafiev; Anatoly Nikolaevich Ozhgikhin; Tatiana Lukianovna Ivanova; Vitaly Rafailovich Belkin, and Elena Georgievna Kryazheva, all of Moscow, U.S.S.R., assignors to Vsesojuzny naushno-issledovatelsky institut khirurgicheskoi apparatury i instrumentov, Moscow, U.S.S.R.

Filed July 12, 1968, Ser. No. 744,518
Int. Cl. B25c *5/02*
U.S. Cl. 227—76 **8 Claims**

A surgical instrument is provided for suturing hollow organs in infants and comprises an oblong tubular body with an open tapered front end with staple slots spaced around the periphery thereof and an oblong hollow rod passes inside the body and is capable of axial movement therealong. A cylindrical staple ejector is loosely mounted on the rod and is provided with toothlike pins spaced around its periphery to fit into the slots in the body. An elastic member is mounted between the rod and the ejector so that a constant travel rate



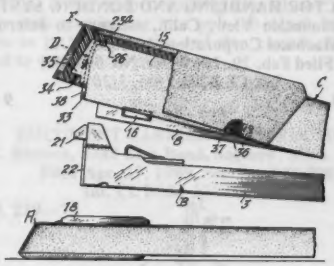
is obtained for the staple ejector. A stem is mounted inside the hollow rod so as to be free to move axially and to rotate around its own axis when extended all the way out of said body, the front end of the stem being pointed and supporting a detachable tapered head having a surface facing the body with staple bending depressions spaced around the periphery of the head.

3,593,904

SPRING LATCH FOR STAPLER MAGAZINE AND COVER

William Leon Gaya, Summit, N.J., assignor to The Bates Manufacturing Company, Orange, N.J.

Filed Aug. 14, 1969, Ser. No. 850,111
Int. Cl. B25c *5/02*
U.S. Cl. 227—128 **6 Claims**



For separably holding against relative swinging movement, two elements hingedly connected at one end, for example, the staple magazine and combined cover and staple driver of a stapler, a normally spring closed, manually openable latch includes keeper lugs projecting from the swinging end of the staple magazine and a latch lever hingedly mounted on the swinging end of the cover. A two-armed leaf spring has one arm secured on said cover adjacent said driver and its other end biasing said latch lever to interlock with said lugs, and said latch lever has finger tabs grippable between an operator's thumb and forefinger for releasing the latch and so located as to reduce possibility of inadvertent manipulation.

3,593,905

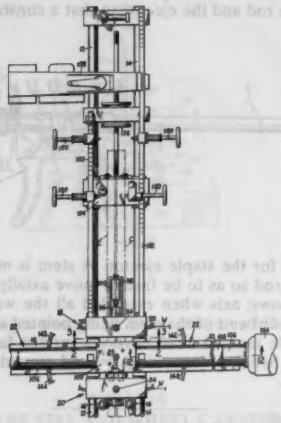
APPARATUS FOR FORMING CHORD ASSEMBLIES HAVING TWO PARALLEL, LATERALLY SPACED MEMBERS

Arthur L. Troutner, Skyline Drive, Boise, Idaho

Filed July 31, 1969, Ser. No. 846,531
Int. Cl. B27f *7/14*
U.S. Cl. 227—152 **12 Claims**

An elongated framework has upper and lower clamps for holding a pair of chord members in parallel, laterally spaced relation. Stapler mechanism is provided on the framework for driving staples into the upper and lower edge surfaces of the two chord members while the latter are held by the clamps for connecting them in their laterally spaced relation

for subsequent construction into truss joists. Two of the stapling mechanisms are provided for applying upper and lower staples at two longitudinal points along the chord



members, and drilling mechanism is provided on the framework between the two stapling mechanisms for providing lateral drilled holes in the chord members.

3,593,906

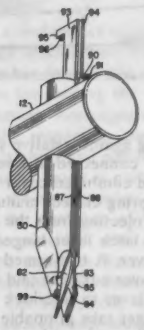
CONDUCTOR HANDLING AND BONDING SYSTEM

Paul Hug, Mountain View, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 20, 1969, Ser. No. 801,081

Int. Cl. B23k *1/06, 5/20*

U.S. Cl. 228—1 **9 Claims**



A system for positioning and attaching small conductors to precise locations on a densely packed circuit board utilizes an ultrasonic-bonding element, within the tip of which are incorporated elements of very small mass for manipulating and controlling the conductor without affecting the bonding operation. Such elements comprise a pair of slidable grippers and a pair of slidable wedge elements disposed within an elongated recess extending along one side of the bonding element. Dependent upon the relative positions of the gripper elements and the wedge members to each other in the bonding tip, as externally controlled, the gripper members may be extended outwardly to secure a conductor, retract the conductor for bonding, and then release the conductor.

3,593,907

DEVICE FOR WELDING BAND ENDS

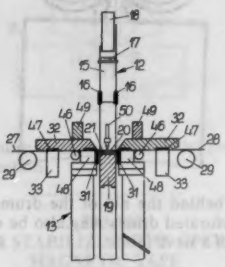
Siegfried Hahne, Rheinkamp-Baerl, Germany, assignor to Messer Griesheim G.m.b.H., Frankfurt am Main, Germany

Filed July 12, 1968, Ser. No. 744,524

Claims priority, application Germany, July 19, 1967, P 16 27 555.1

Int. Cl. B23k *1/20*

U.S. Cl. 228—4 **8 Claims**



A device for welding band ends together includes a shear at the upper crossbeam of its frame to trim the band ends and a lower crossbeam which is constructed to function as the bearing surface area for the welding pool.

3,593,908

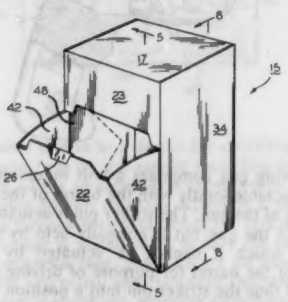
DISPENSER BIN CARTON

John D. Desmond, and Joseph J. Hart, both of Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 17, 1969, Ser. No. 792,052

Int. Cl. B65d *1/22, 5/42*

U.S. Cl. 229—17 **5 Claims**



A dispenser bin carton formed from a cut and scored blank and characterized by front, back, top, bottom and opposed side panels, the front panel being separable into a fixed portion and a movable bin front portion, the latter being reinforced by a locking panel glued thereto and having bin side panels extending therefrom movable between reinforcing flaps extending from the top and bottom panels to prevent product interference with opening and closing.

3,593,909

REACTION VESSEL CLOSURE

Wilhelm Bergmann, Hamburg, Germany, assignor to Eppendorf Geraetebau Netheler & Hinz G.m.b.H., Hamburg, Germany

Filed Apr. 29, 1969, Ser. No. 820,232

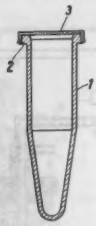
Claims priority, application Germany, May 2, 1968, P 17 73 331.2

Int. Cl. B65d *5/64, 43/00*

U.S. Cl. 229—43 **12 Claims**

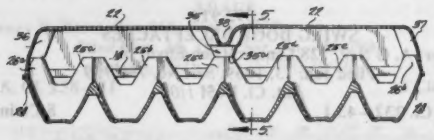
A vessel for small quantities of liquid including a top clo-

sure comprising a pierceable foil responsive to puncture by



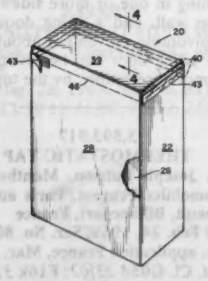
an obliquely sharpened cannula by elastic deformation of the prick hole into close bearing contact with the cannula.

3,593,910
CARTON FOR FRAGILE ARTICLES
Clifford H. Bessett, South Holland, Ill., and James W. Boyd, Crown Point, Ind., assignors to Packaging Corporation of America, Evanston, Ill.
Filed July 10, 1969, Ser. No. 840,799
Int. Cl. B65d *85/32*
U.S. Cl. 229—44 R **5 Claims**



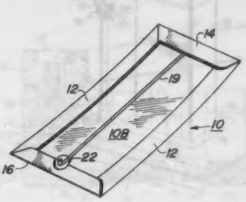
A carton for accommodating a plurality of fragile articles is provided which includes a tray section, a cover section, and a hinge section interconnecting the backwalls of the cover and tray sections. The tray section is provided with upwardly extending members disposed adjacent the ends thereof; said members engage the interior surfaces of the end walls of the cover section and guide the latter into proper superposed relation with respect to the tray section when said cover section is moved to its closed position.

3,593,911
REMOVABLE TAPE FOR RECLOSEABLE CARTON
Ernest C. Pellaton, Larkspur, Calif., assignor to Fibreboard Corporation, San Francisco, Calif.
Filed May 14, 1969, Ser. No. 824,554
Int. Cl. B65d *45/00*
U.S. Cl. 229—45 **4 Claims**



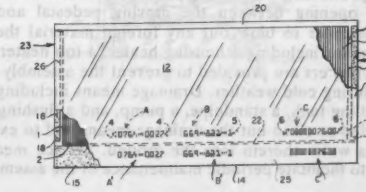
An erected frozen food carton comprises top and bottom closures connected together by vertically disposed front, back and side panels. The sealed top closure has a continuous cut line formed completely through at least a portion of three of the panels to form a recloseable cover. A removable tape is adhesively secured over the cut line and is adapted to be removed to permit at least a portion of the end panel to be opened to expose the carton contents.

3,593,912
ENVELOPE WITH LIGHT-TRANSMITTING WINDOW AND TEAR STRIP
Peter C. Collura, Stamford, Conn., and William P. Pintsak, Pottstown, Pa., assignors to Container Corporation of America, Chicago, Ill.
Filed Oct. 20, 1969, Ser. No. 867,569
Int. Cl. B65d *27/04, 27/32*
U.S. Cl. 229—71 **4 Claims**



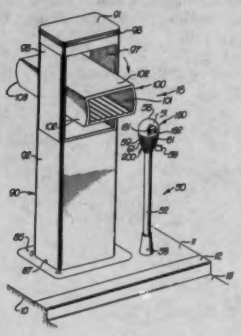
An envelope having a light-transmitting window therein, the envelope being formed from a cut and scored blank with the window superimposed thereon and adhered thereto, the blank having opposed side and end flaps folded over the window and adhered thereto. The side flaps are folded along curved fold lines, so that when they are adhered to the window, the latter is raised from the central panel to permit the envelope contents to be readily accommodated therein. The window has a tear strip extending beyond one end thereof, the tear strip terminating in a pull tab which is folded to a position to be engaged, the end flap closure thereat being notched to uncover the pull tab.

3,593,913
DOCUMENT CARRIER CONSTRUCTION
Fred C. Bremer, 4740 Rica Road, Saginaw, Mich.
Filed Apr. 29, 1969, Ser. No. 820,090
Int. Cl. B65d *27/00, 27/08*
U.S. Cl. 229—72 **10 Claims**



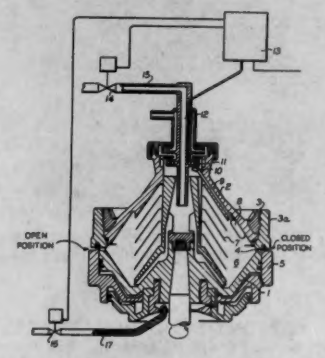
A carrier adapted to contain a document provided adjacent its bottom edge with magnetic ink characters capable of use with automatic sorting machinery, the carrier having a compartment in which such a document may be accommodated and having an extension below the compartment which supports the document at such level as to render the magnetic ink characters thereon ineffective and on which may be provided magnetic ink characters corresponding to those on the document. The compartment has at least one open side through which the document may be inserted and air passages in communication with the interior of the compartment to prevent the accumulation of air within the receptacle. The walls of the receptacle preferably are relatively transparent, but the extension at the bottom of the compartment is relatively opaque.

3,593,914
RETRACTABLE MAILBOX ASSEMBLY
John J. Van Orden, 10226 Tunney Ave., Northridge, Calif.
Filed Nov. 20, 1969, Ser. No. 878,308
Int. Cl. A47g *29/12*
U.S. Cl. 232—17 24 Claims



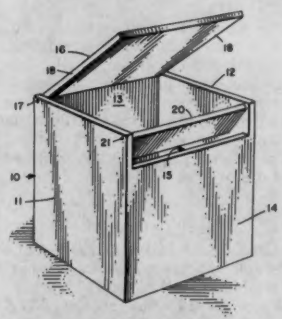
A retractable mailbox assembly includes an open-topped casing recessed into the ground adjacent the curb, an open upper-ended hollow housing mounted within and to the casing, with a housing sleeve assembly therein mounting a supporting pedestal vertically movable between a lower or retracted position completely within the housing with the upper end thereof flush with the top of the housing and the surrounding surface area, and a raised or operative position extending upwardly to a selected height above the ground level where postal delivery may be made into a receptacle carried by the pedestal adjacent the upper end thereof. The receptacle pivots through an angle of 90° between closed and open positions during the travel of the pedestal adjacent its raised position. Moving means is provided for the pedestal including drive means with an electric motor and sprockets, driven means with chains, sprockets, and counterweights, and pivoting means with gears, chains, and springs to move the pedestal and the receptacle between the two positions. Key-controlled switch means in a control post are provided to selectively operate the moving means. Vent means is provided to supply air from the control post into the interior of the housing during movement of the pedestal between its two positions, and the vent means includes flapper valves and piston rings enabling the moving pedestal to force air out of a restricted opening between the moving pedestal and the housing in order to blow out any foreign material therein. Heating means including a housing heater, a top heater, and intake air heaters are provided to prevent the assembly from freezing during cold weather. Drainage means including gutters, a settling tank, a standpipe, a pump, and a flushing pipe are provided to clean out the drainage means and to exhaust the excess water therein into the ground. Service means is provided to facilitate periodic maintenance of the assembly.

3,593,915
CONTROLLED DESLUDGING OF CENTRIFUGAL SEPARATORS
Peter Steinacker, Oelde, Westphalia, Germany, assignor to Westphalia Separator AG., Oelde, Westphalia, Germany
Filed Apr. 30, 1969, Ser. No. 820,421
Claims priority, application Germany, Sept. 25, 1968, P 17 82 612.9
Int. Cl. B04b *11/00*
U.S. Cl. 233—20 4 Claims



A self-cleaning liquid-solids separator with valve means, such as a controllable sliding-ring valve, for discharging sludge through the periphery of the bowl is equipped with a float that will sense the liquid-solids interface in the bowl during operation. A sensing device, e.g. an electric coil, is attached to the shaft of the drum and senses the position of an elongated member or rod attached to the float and extending inwardly towards the shaft. When the end of the rod approaches close enough to the shaft, which indicates the sludge has built up to a predetermined level, the sensing device activates opening of the sludge discharge valve means, and if desired, after a certain amount of sludge has been discharged, the closing of the valve means.

3,593,916
SWING DOOR RECEPTACLES
Robert A. O'Neil, 728 Lennox, Glen Ellyn, Ill.
Filed Jan. 13, 1969, Ser. No. 790,739
Int. Cl. B65f *1/00*
U.S. Cl. 232—43.1 8 Claims

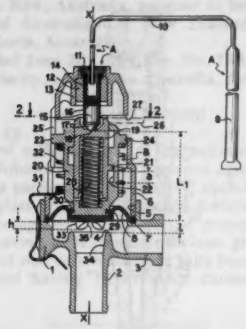


Swing door receptacles having a pivotable or removable top wall, an opening in one or more sidewalls preferably intersecting the top wall, and a swing door in each opening supportable for pivotable movement about an axis along its upper edge. The swing door can be pivotably supported by the sidewalls or, more preferably, by the top wall.

3,593,917
THERMOSTATIC TAP
Andre Sebastien Joseph Buisson, Montbellard, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Billancourt, France
Filed Feb. 24, 1969, Ser. No. 801,545
Claims priority, application France, Mar. 1, 1968, 141962
Int. Cl. G05d *23/02*; F16k *31/00*
U.S. Cl. 236—98 8 Claims

Thermostatic tap of the type comprising an automatically operating thermostatic device having a bulb and a capillary tube and a manually controlled regulating device. This tap has the feature that the end of the receiving element of the thermostatic device has a position which is fixed relative to the body of the tap and to the bulb. The manually controlled

regulating device is coaxial with the receiving element and interposed between the latter and a valve seat and carries a



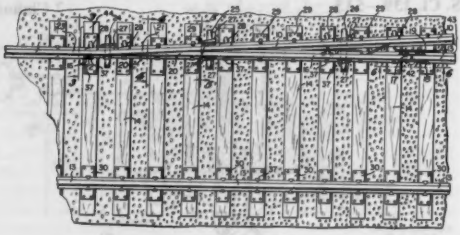
valve which cooperates with the seat and modifies the section of the passage for the heating fluid in the tap body.

3,593,918

APPARATUS FOR TEMPORARILY CONNECTING A CONVENTIONAL BOLTED RAIL TO A LAID PORTION OF A CONTINUOUS WELDED RAIL OF A RAILWAY TRACK

Henry V. Borst, Box 266, Waymart, Pa.

Filed Mar. 28, 1968, Ser. No. 716,799
Int. Cl. E01b *5/18, 11/08, 29/40*
U.S. Cl. 238—21 3 Claims



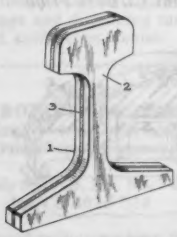
Apparatus for use in temporarily operationally connecting one or both rails of bolted railway track to a laid portion of continuous welded rail or rails of railway track, without permanently bending or cutting the welded rail, during the course of removal of bolted or jointed rails and replacement thereof with continuous welded rail, when it is desired to connect a bolted rail and a welded rail to enable train traffic thereover.

3,593,919

STRUCTURAL END POST UNIT FOR RAILWAY TRACK

William R. Hamilton, Jr., Naperville, Ill., assignor to Portec, Inc., Chicago, Ill.

Filed Mar. 28, 1969, Ser. No. 811,479
Int. Cl. E01b *11/00, 11/32, 26/00*
U.S. Cl. 238—152 5 Claims



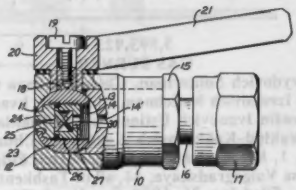
A structural end post unit for insulating railway track rails which reduces the insulation medium to a minimum between metallic plates, and fulfills its primary function of becoming a load bearing member of the rail joint.

3,593,920

SPRAY HEAD

Harold S. Watson, Rainhill, near Liverpool, England, assignor to Delavan Manufacturing Company

Filed Jan. 10, 1969, Ser. No. 790,213
Claims priority, application Great Britain, May 31, 1968, 26095/68
Int. Cl. B05b *15/02*
U.S. Cl. 239—119 10 Claims



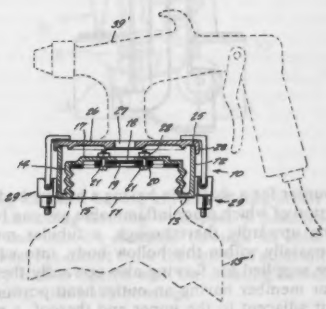
A spray head having a spray tip carrying holder which is rotatable between a spraying position and a spray tip cleaning position, includes a deflection member which breaks up the needlelike jet issuing from the spray tip when the tip is in issuing cleaning position.

3,593,921

SPRAY GUN ATTACHMENT

Charles Boltic, 746 Lemington St., Greensburg, Pa.

Filed Aug. 18, 1969, Ser. No. 850,988
Int. Cl. B65d *41/34, 51/20*
U.S. Cl. 239—318 2 Claims



An attachment for a spray gun so that it may be readily attached directly to a disposable paint container within which the paint is purchased, the attachment comprising an adapted that is threadingly secured over the paint container and which includes a pair of hold down clamps for securing a lower end of the spray gun thereto.

3,593,922

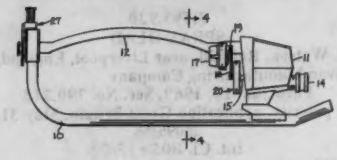
SPRINKLER

George M. Standal, 1916 San Fernando Place, Victoria British ColumbiaA, Canada

Filed Feb. 27, 1970, Ser. No. 15,129
Int. Cl. B05b *3/16*
U.S. Cl. 239—242 8 Claims

A lawn sprinkler of the oscillating type modified from the conventional structure to even water distribution over the area covered thereby. A spring-loaded crank is interposed between the motor drive shaft and the oscillating spray pipe to accelerate movement of the spray pipe a the driving crank

arm assembly moves overcenter. A controllable friction brake is provided to retard movement of the spray pipe in a

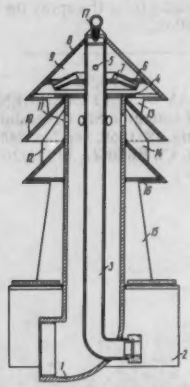


preselected pattern so as to insure more even distribution of water during movement of the spray pipe.

3,593,923
GAS BURNER

Natan Davydovich Soliterman, Chinabadskaya ulitsa, 19, kv. 3; Boris Izrailovich Nudelman, Chilanzar, kvartal 8, 27, kv. 44; Valentin Ivanovich Ustinov, ulitsa Takhiatashskaya, 9, kv. 2; Vakhid Kakharovich Kakharov, Chilanzar, proezd Zharky, 1, kv. 3, and Petr Mikhailovich Filippov, Chilanzar, ulitsa Volgogradskaya, 44, all of Tashkent, U.S.S.R.

Filed Jan. 26, 1970, Ser. No. 5,474
Int. Cl. F23d *15/02*
U.S. Cl. 239—418 **2 Claims**



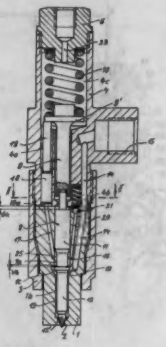
A gas burner for a shaft kiln having a hollow body, into the lower portion of which a noninflammable gas can be supplied for flowing upwardly therethrough, a tubular member extending coaxially within this hollow body, into which a fuel gas can be supplied for flowing also upwardly therethrough, the tubular member having an outlet head portion received thereabout adjacent to the upper end thereof; a plurality of cone-shaped deflectors are received about the body and the tubular member, these deflectors tapering upwardly and being vertically spaced from one another, whereby at least two chambers are formed therebetween for the noninflammable gas and fuel gas to issue into these chambers, respectively, from the body and from the tubular member.

3,593,924
VALVE FOR THE ADVANCE AND MAIN INJECTION OF FUEL

Konrad Eckert, Stuttgart-Bad Cannstatt, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 11, 1970, Ser. No. 10,447
Claims priority, application Germany, Feb. 14, 1969, P 19 07 340.6
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **5 Claims**

In a fuel injection valve, the initial opening motion of the valve needle (advance injection) is effected by the fuel pressure exerting a force directly on the valve needle and also on pistons connected therewith. Upon a predetermined displacement, the valve needle, by means of a control groove pro-

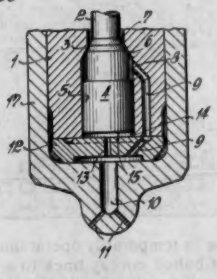


vided therein, cuts off the pressure supply to said pistons so that an elevated pressure level is required to cause further displacement (main injection) of the valve needle.

3,593,925
FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES

Konrad Eckert, and Heinz Links, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 11, 1970, Ser. No. 10,459
Claims priority, application Germany, Feb. 14, 1969, P 19 07 341.7
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **7 Claims**

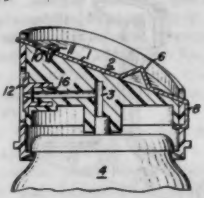


In a fuel injection valve, in order to ensure that minimal or no fuel pressure is exerted in a closing direction on the valve needle when the latter is in an open position, the supply channel leading from the downstream side of the valve seat to the nozzle openings circumvents the valve needle and the latter, in said open position, hermetically engages with its base face a stationary frontal plate held in the valve.

3,593,926
APPARATUS FOR DISSEMINATING LACHRYMATORY MATERIAL

Joseph Kozub, Abingdon, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 2, 1969, Ser. No. 863,170
Int. Cl. B05b *11/00*
U.S. Cl. 239—579 **8 Claims**



An apparatus and method for disseminating lachrymatory material having a safety means to prevent premature dissemination and a variable spray nozzle means.

3,593,927

PROCESS OF COMMINUTION OF AN AQUEOUS SUSPENSION OF COPPER PHTHALOCYANINE

Keith G. Neill, Kew, Australia, assignor to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia

Filed June 20, 1968, Ser. No. 738,405
Claims priority, application Australia, July 12, 1967, 24,497/67
Int. Cl. B02c *19/00*
U.S. Cl. 241—16 8 Claims

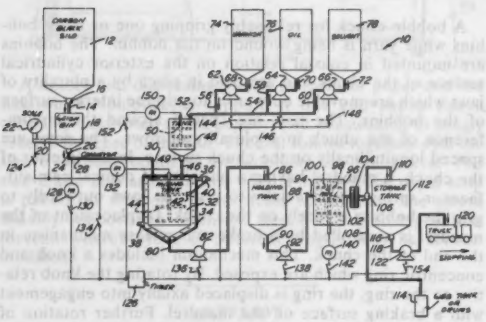
A process of comminution of an aqueous suspension of beta copper phthalocyanine, by vigorous agitation in a grinding mill, with a particulate grinding aid such as sand or beads of porcelain, glass or insoluble plastic material, the improvement which comprises milling in the presence of an alkyl glycol ether having at least one ethylene glycol unit in the molecule and of one or more amine salts bearing at least one alkyl substituent having 12 or more carbon atoms in the chain.

3,593,928

SYSTEM FOR PRODUCING PRINTING INKS

Morris Friedland, New York, N.Y., assignor to Millmaster Onyx Corporation, New York, N.Y.

Filed Aug. 20, 1969, Ser. No. 851,564
Int. Cl. B02c *17/16, 25/00*
U.S. Cl. 241—34 4 Claims



A system for manufacturing printing inks and the like which includes a weighing bin for the solids material, such as carbon black, this bin being operatively connected to a scale which trips a timer mechanism when the material in the bin reaches a predetermined weight. The timer mechanism actuates a release valve in the bin as well as a conveyor which moves the released solids to a mixing tank. The timer also releases a predetermined amount of liquid materials, such as varnish, oils, and solvents, into the mixing tank. The timer causes agitation of the materials in the mixing tank for a predetermined time, after which the mixture is passed to a holding tank and then to a ball mill or the like where it is finally ground. It is then passed through screens of predetermined mesh to storage and dispensing tank. All these steps take place in a timed, continuous manner.

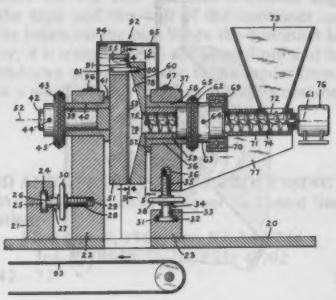
3,593,929

ECCENTRIC ROTARY GROUNDWOOD MILL

Frank P. Hughes, Hawkesbury, Ontario, Canada, assignor to Canadian International Paper Company, Montreal, Quebec, Canada

Filed July 5, 1968, Ser. No. 742,667
Int. Cl. B02c *7/10*
U.S. Cl. 241—146 17 Claims

A rotary groundwood mill comprising two discs arranged to face each other and rotated in their major planes about eccentrically located axes. The discs are rotated at exactly the same speeds and in the same rotational direction. The mill



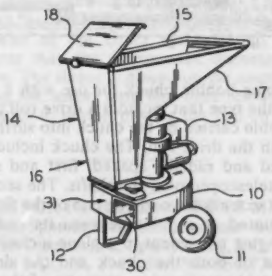
structure is such that a piece of wood entrapped between the discs will be subjected to epicyclic abrasion.

3,593,930

SHREDDER

Robert D. Lautzenheiser, Bluffton, Ind., assignor to The Red Cross Manufacturing Corp.

Filed Sept. 11, 1970, Ser. No. 71,425
Int. Cl. B02c *18/06, 13/18, 13/382*
U.S. Cl. 241—188 R 9 Claims



A shredding machine having knives rotating about a vertical axis in a shredding housing. A hopper is positioned atop the housing and delivers material through an inlet to the shredding space. An outlet from the space is adjacent the inlet. Stationary baffles interfit with the rotating knives to cut and tear material within the housing.

3,593,931

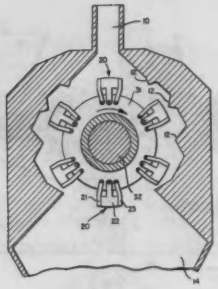
ROTARY CRUSHER HAMMERS

William F. Hahn, Devon, Pa., assignor to Pennsylvania Crusher Corporation, Broomall, Pa.

Filed Mar. 28, 1969, Ser. No. 811,541
Int. Cl. B02c *13/04, 13/28*
U.S. Cl. 241—194 11 Claims

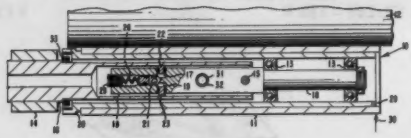
In a rotary hammer crusher, at least two hammers are employed at each hammer position, each hammer being independently pivotally suspended from the rotor disc. The front hammer (as determined by the direction of rotation of the rotor shaft) functions as the wear hammer and is made of manganese or other steel having good wear-resistant properties. This hammer is usually light in weight and thin in thickness compared with the rear or backup hammer. The front hammer is so shaped and so pivotally suspended relative to the backup hammer than when the rotary crusher is rotating at operating speed, the front hammer maintains an abutting relationship against the heavy mass backup hammer,

and the two hammers function as a single unit. If the rotary crusher is a reversible crusher, three hammers are usually



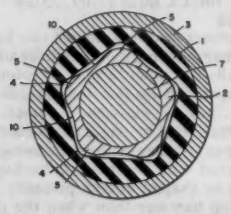
used at each position, the middle hammer being the backup hammer.

3,593,932
BOBBIN CHUCK
Maryland Virginia Altice, New Castle, and William David Walker, Wilmington, both of, Del., assignors to E.I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 17, 1969, Ser. No. 885,855
Int. Cl. B65h *54/02, 75/18*
U.S. Cl. 242—18 6 Claims



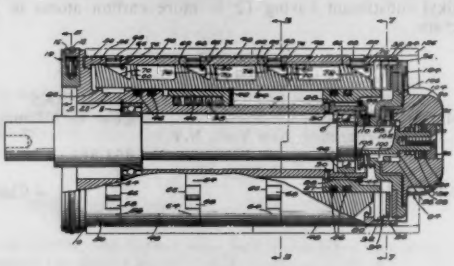
A self-aligning bobbin chuck for use with a yarn winding apparatus of the type that includes a drive roll and means for moving a bobbin carried by the chuck into surface driven engagement with the drive roll. The chuck includes concentrically arranged and radially spaced, first and second shafts and a sleeve telescoped over the shafts. The second shaft has a portion that extends beyond one end of the first shaft and is pivotally mounted at a point between its ends to the first shaft for swinging movement in a plane inclusive of the longitudinal axes of both the chuck and the drive roll. The sleeve is rotatably mounted to one end of the second shaft while a damping means is coupled between the other end of the second shaft and the first shaft to dampen out rapidly applied shock loads.

3,593,933
DEVICE FOR THE SLIP-FREE COUPLING OF A DRIVE SHAFT TO A WINDING SLEEVE
Ingo Grashorn, Wuppertal-Langerfeld, Germany, assignor to J. P. Bemberg Aktiengesellschaft, Wuppertal, Germany
Filed Aug. 6, 1968, Ser. No. 750,655
Claims priority, application Germany, Aug. 14, 1967, P 15 74 310.9
Int. Cl. B65h *17/02, 75/30*
U.S. Cl. 242—46.4 10 Claims



A device for the slip-free coupling of a drive shaft to the winding sleeve of a takeup spool, e.g. in the winging collection of filaments, threads, yarns, foils and the like onto a cylindrical spool or roller, the coupling means consisting essentially of a hollow tubular resilient elastic casing drawn loosely onto a cam- or gear-shaped collar having radially projecting arcuate cogs adapted to engage a polygonal inner periphery of the hollow tubular casing.

3,593,934
HIGH SPEED BOBBIN CHUCK
Peter Conrad, Charlotte; Thomas E. Morris, Concord, and Frank W. Taylor, Matthews, all of, N.C., assignors to Celanese Corporation, New York, N.Y.
Filed July 29, 1968, Ser. No. 748,354
Int. Cl. B65h *75/30*
U.S. Cl. 242—46.5 9 Claims

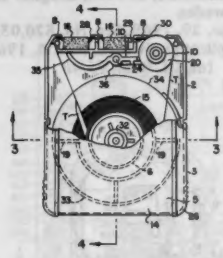


A bobbin chuck for releasably gripping one or more bobbins while yarn is being wound on the bobbin. The bobbins are mounted in coaxial relation on the exterior cylindrical surface of the chuck and are held in place by a plurality of jaws which are movable outwardly to grip the interior surface of the bobbins. The jaws are spaced around the circumference of the chuck in a plurality of rows. The rows are spaced longitudinally on the chuck surface. In the interior of the chuck, a mandrel having a plurality of conical cam surfaces is spring biased axially to urge the jaws outwardly to grip the bobbins securely on the chuck. Displacement of the mandrel is controlled by a brake and release mechanism in the end of the chuck. This mechanism includes a knob and concentric ring which are exposed. By rotating the knob relative to the ring, the ring is displaced axially into engagement with a braking surface on the mandrel. Further rotation of the knob transmits an axial force through the concentric ring to the mandrel in opposition to the mandrel spring. As the mandrel is displaced by rotation of the knob, the cam surfaces move relative to the jaws, thereby allowing the jaws to be retracted by springs attached to the jaws. When the jaws are retracted, the bobbins are released. The bobbins then may be readily removed from the chuck and replaced with empty bobbins.

3,593,935
ENDLESS LOOP TAPE CARTRIDGE
Theodore Ritz, Jr., 3691 Whitfield, Waterford, Mich., and Joseph M. Richtarcik, 20021 Avalon, St. Clair Shores, Mich.
Filed Nov. 20, 1967, Ser. No. 684,373
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 8 Claims

A magnetic tape cartridge houses an endless coiled tape with an exterior loop of tape extending from the inside convolution of the coil, past suitable guide means, over tape head pads and a pressure member disposed adjacent to openings in the front of the cartridge, to then return to the outer convolution of the coil. The coil is supported on a spool composed of a resilient washer or flange snapped over a series of annular projections on the lower portion of a concentric hub. A resilient plastic pressure means is pivotally mounted inside the cartridge and in one embodiment carries a pressure roller to engage and press the tape loop against a driven capstan to feed the tape. An alternate embodiment uses a reversely curved compression arm to press the tape

against the capstan. When the cartridge is removed from the capstan the pressure roller or compression arm is arranged so



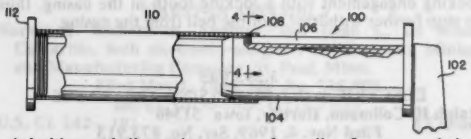
as to press the tape against the edges of the adjacent cartridge opening.

3,593,936

DISPENSING HOLDER FOR PAPER ROLLS AND THE LIKE

James G. Davis, 41 Lincoln Ave., Yeadon, Pa.

Filed Aug. 28, 1969, Ser. No. 853,787
Int. Cl. A47k *10/22, 10/40*; B65h *19/00*
U.S. Cl. 242—55.2 2 Claims



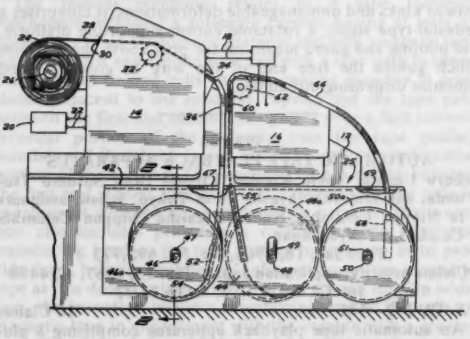
A holder and dispensing means for rolls of paper and the like which comprises a support at one end and a sleeve rotatably connected to the support and constructed to snugly receive the core of the roll. The roll rotates together with the sleeve without bouncing or wobbling on the sleeve. The sleeve also acts as an anchor when a piece of the paper strip is pulled off the roll at one of the score lines. The sleeve slidably supports an extension sleeve in adjusted positions thereon whereby rolls of different lengths may be accommodated.

3,593,937

TAPE HANDLING APPARATUS

Jack J. Rejsa, Minneapolis, and Roy L. Swanson, Richfield, both of, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of application Ser. No. 653,547, July 14, 1967, now abandoned. This application Sept. 12, 1969, Ser. No. 857,530
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.21 2 Claims



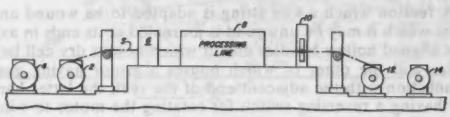
A winding, storing and unwinding device for paper tape including three support pins mounted in horizontal alignment. A cup-shaped, cylindrical container is mounted for free rotation and quick removal upon each of the pins. A tape punch and tape reader are located adjacent to the pins. During operation tape passes from the punch through a guide into the container on the first pin and frictional engagement between the tape and the wall of the container causes the container to rotate on the pin. When the container is filled in this manner, it is transferred to the second pin and its leading edge is withdrawn and introduced to the reader from which it passes into a similar freely rotating storage container on the third pin.

3,593,938

METHOD AND APPARATUS FOR PROCESSING STRIP

Craig B. Watt, Portage, Ind., assignor to United States Steel Corporation

Filed Oct. 8, 1969, Ser. No. 864,744
Int. Cl. B65h *75/24*; B21c *47/02*
U.S. Cl. 242—72 5 Claims



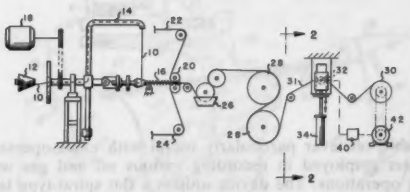
In the continuous processing of strip in which the expandable uncoiler mandrel at the entry end of the processing line has a larger diameter than the expandable coiler mandrel at the exit end of the line a resilient sleeve is provided to permit reuse of a leader strip which pulls prime strip through the line after shut downs. The resilient sleeve has a slot extending across its width, an internal diameter greater than the unexpanded diameter of the coiler mandrel and an external diameter greater than the unexpanded diameter of the uncoiler diameter. The sleeve is placed on the uncoiler mandrel prior to coiling the leader strip and then removed from the coiled leader strip to permit placing the coil on the uncoiler mandrel.

3,593,939

APPARATUS FOR PROCESSING SHEET MATERIAL

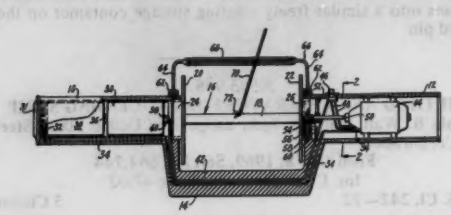
Milton M. Bolles, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartenburg, S.C.

Filed Sept. 10, 1969, Ser. No. 856,734
Int. Cl. B65h *51/20, 59/38*
U.S. Cl. 242—75.5 4 Claims



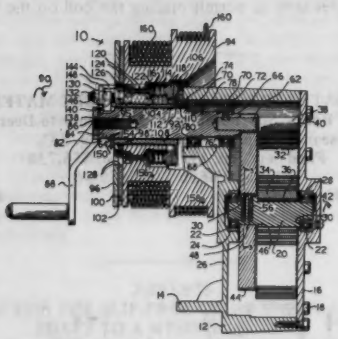
Apparatus for processing sheet material of continuous length including a rotatable collection roll for accumulating the material and a compensating roll operatively associated therewith for influencing the takeup of the sheet material by displacement of the axis of the compensating roll to vary the length of the path of travel of the sheet material to the collection roll, and wherein means are provided for fixing the axial position of the compensating roll to prevent its causing backwinding of sheet material from the collection roll when the collection roll is temporarily stopped.

3,593,940
POWER-DRIVEN KITE STRING REEL
Elbert Stanton, 18039 Hubbell, Detroit, Mich.
Filed Oct. 21, 1969, Ser. No. 868,077
Int. Cl. B65h *75/40*
U.S. Cl. 242—96 10 Claims



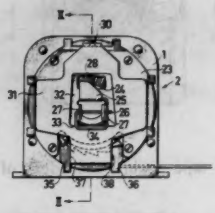
A reel on which a kite string is adapted to be wound and from which it may be unwound is journaled at its ends in axially aligned hollow handles one of which houses dry cell batteries and the other of which houses a motor having gear connection with the adjacent end of the reel, the latter handle having a reversing switch for rotating the motor to wind or unwind the string.

3,593,941
CABLE RETRIEVER
Samuel H. Smith, Oklahoma City, Okla., assignor to Drillograph Company, Inc., Oklahoma City, Okla.
Filed May 2, 1969, Ser. No. 821,304
Int. Cl. B65h *75/48*
U.S. Cl. 242—107 7 Claims



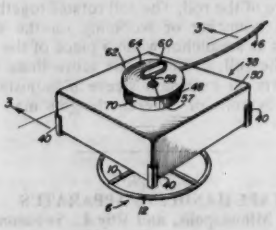
A cable retriever particularly useful with cable-operated recorders employed in recording various oil and gas well drilling operations. The device utilizes a flat spiral-type tension spring which is wound as cable is pulled from the device, and the spring rewinds the cable when the cable is released. The spring drives the cable reel through the medium of a ring gear and pinion wherein the ring gear is mounted by means of what might be characterized as an overriding clutch which functions to drive the ring gear to retrieve the cable, but which allows the ring gear to continue rotation in the event the cable breaks, to eliminate the imposition of incorrect forces on the spring and protect the spring from breakage. The reel is mounted on the device through the medium of a friction clutch which permits slippage of the reel with respect to the spring drive system in the event an excessive pulling force is imposed on the cable to protect the spring from being over-loaded.

3,593,942
AUTOMATIC LOCKING DEVICE FOR SAFETY BELTS
Gert Ingmar Rex, Halmstad, Sweden, assignor to AB Autoindustri, Halstad, Sweden
Filed Apr. 29, 1969, Ser. No. 820,052
Claims priority, application Sweden, Nov. 5, 1968, 14965/68
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.4 8 Claims



This automatic locking device for a vehicle safety belt has a shaft rotatably mounted within a casing for reeling up the belt. A rotor, which is secured to the shaft, carries a pivotal locking pawl normally held in an inoperative position by an inertia-responsive member which is spring-loaded to rotate with the rotor. Should the wearer be thrown suddenly forward, the acceleration causes the inertia-responsive member to rotate relative to the rotor, and to pivot the pawl into locking engagement with a locking tooth in the casing, thus to stop further withdraw al of the belt from the casing.

3,593,943
ELECTRIC WIRE DISPENSING APPARATUS
Ralph H. Collmann, Hartley, Iowa 51346
Filed Nov. 4, 1969, Ser. No. 873,913
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 9 Claims

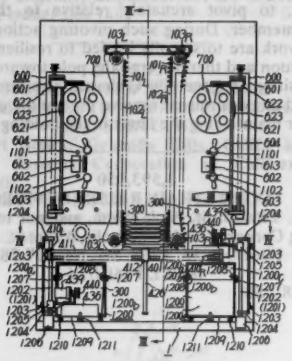


A portable supporting apparatus for systematically unwinding conduit wire (Romex for example) protectively coiled for use in cardboard cartons of various sizes. It permits the wire to be pulled out and dispensed smoothly without twisting. One man can pull the wire up through walls and wherever else necessary without having to return to the carton to untwist kinks and unmanageable deformations. It comprises a pedestal-type stand, a rotatable carton supporting platform, and piloting and guard means on the post above the platform which guides the free end of the wire to govern it and minimize dispensing difficulties.

3,593,944
AUTOMATIC TAPE PLAYBACK APPARATUS
Saburo Umeda; Tokio Kizuka; Kiyoshi Iwai; Susumu Tsunoda, and Hideaki Hayashi, all of Tokyo, Japan, assignors to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.), Tokyo, Japan
Filed Jan. 18, 1968, Ser. No. 698,773
Claims priority, application Japan, Jan. 23, 1967, 42/4490
Int. Cl. G03b *1/04*; G11b *15/32*
U.S. Cl. 242—181 10 Claims

An automatic tape playback apparatus comprising a plurality of cartridges each having incorporated therein a reel with a recorded magnetic tape wound thereon and means for fastening one end portion of the tape to one sidewall of the cartridge, means for arranging the plurality of cartridges in

order of a program, means for automatically bringing the cartridges to right and left playback positions, means for drawing out the tape from the cartridge to a takeup reel, and means for playing back signals recorded on the tape.



3,593,945

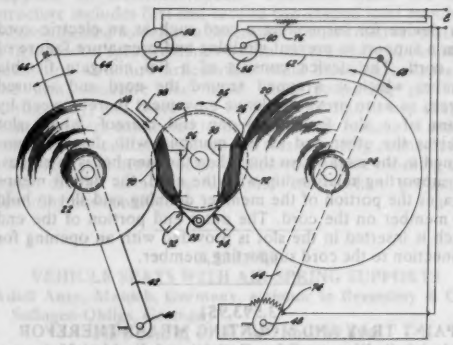
CAPSTAN ASSEMBLY

Harvey J. Richardson, Ventura, and Dean L. De Moss, Camarillo, both of, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 1, 1968, Ser. No. 725,808

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—192 **8 Claims**



The present invention relates to a tape transport mechanism including a rotatable capstan having at least an outer layer of an elastomeric material and with magnetic tape formed in first and second rolls and with a tape path between the first and second rolls. A tape guiding member is positioned adjacent to the rotatable capstan and the tape path between the first and second rolls passes over a first circumferential portion of the capstan, over the tape guiding member and then back to and over a second circumferential portion of the capstan. The magnetic tape is driven between the first and second rolls by directly maintaining the rolls in engagement with the outer layer of the capstan. The invention also includes providing a rotatable helical magnetic transducing head as the tape guiding member so as to provide for a helical recording of information on the magnetic tape as it is driven between the first and second rolls. In addition, the invention includes maintaining one of the rolls of magnetic tape in engagement with the capstan with a greater force than is used to maintain the other of the rolls so as to provide for a tension in the tape path. The present invention may also be incorporated in a tape cartridge by including at least the first and second rolls in a common outer housing.

3,593,946

TAPE RECORDING AND/OR REPLAY MACHINE AND CASSETTE AND CARTRIDGE FOR USE THEREWITH

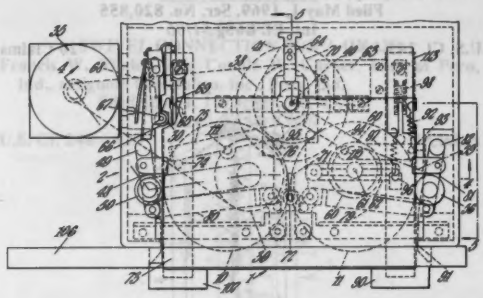
Peter R. D. Shardlow, Egham, Surrey, England, assignor to Tape Systems Limited, Egham, Surrey, England

Filed July 9, 1969, Ser. No. 840,430

Claims priority, application Great Britain, July 10, 1968, 32995/68

Int. Cl. B65h *17/48*; G03b *1/04*; G11b *15/32*

U.S. Cl. 242—192 **20 Claims**



A tape recording and/or replay machine having a slot into which a cassette or cartridge can be inserted. The cassette has two spools, flanges of which project through opposite sidewalls of the cassette whereas the cartridge has a single spool a flange of which projects through a sidewall of the cartridge. Both the cassette and the cartridge have a tape guidance system including a spring pinch wheel. The machine has a motor driven capstan, a continuously driven first drive wheel which engages the projecting flange of one spool when a cassette is inserted into the slot and the projecting flange of the spool when a cartridge is inserted into the slo t. A second drive wheel of the machine engages the projecting flange of the other spool when the cassette is inserted into the slot. For rewind the first drive wheel is moved out of engagement with the flange it normally engages and the second drive wheel is coupled to the motor and drives the tape in the reverse direction.

3,593,947

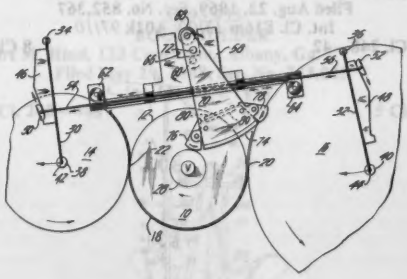
TAPE TRANSPORT APPARATUS

Ralph Johnson, Huntington, N.Y., assignor to Sylvania Electric Products, Inc.

Filed Dec. 8, 1969, Ser. No. 882,959

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—192 **5 Claims**



A tape transport utilizes a reversible rotatable capstan interposed between two spaced tape wound spools and making resilient peripheral contact with a selected point on each spool. The direction of rotation of the capstan determines which spool acts as a supply spool and which spool acts as a takeup spool.

Cams, cam followers, first means coupled to and extending between the followers, and second means cooperating with

the first means and coupled to the drive shaft of the capstan establish a first pressure urging the takeup spool toward the capstan and applied at the point of arrival which is larger than and oppositely directed to a second pressure urging the supply spool toward the capstan and applied at the point of departure.

3,593,948

CONTAINER FOR PNEUMATIC CARRIER SYSTEMS

Ralph E. McClellan, Toledo, Ohio, assignor to Meilink Steel Safe Company, Toledo, Ohio

Filed May 1, 1969, Ser. No. 820,855
Int. Cl. B65g *51/06*
U.S. Cl. 243—34 20 Claims

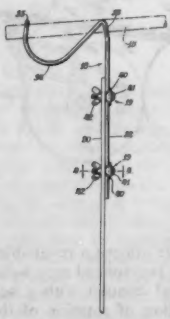
An elongated container for holding articles having two symmetrical semicylindrical body sections which are hinged together along one of their adjacent longitudinal edges for movement thereabout. A cup-shaped cap is attached to one end of each body section with the open face of each cap adapted to move axially toward and away from the end of at least one of the body sections. Thus these caps when moved toward each other lock the two body sections together, and when moved away from each other permit the body sections to open about their hinge. These caps may be axially movable relative to the ends of both body sections by cam means against the bias of springs or magnets, or the body sections may move axially relative to each other to move the caps away from one body section. The outer faces of the caps may be provided with buffer pads to protect the container during handling and use thereof.

3,593,949

POLE HOLDER

Henry J. Fliege, 1618 W. Margaret Ave., Peoria, Ill.

Filed Aug. 22, 1969, Ser. No. 852,367
Int. Cl. F16m *13/00*; A01k *97/10*
U.S. Cl. 248—42 8 Claims



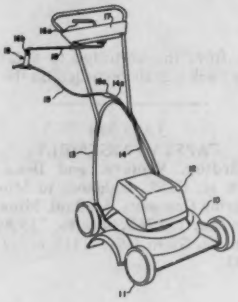
A fishing pole or rod holding device formed with a wire framework suitably shaped to provide a pair of parallel spaced legs clamped by adjustable fasteners to a rigid mounting member adapted to be anchored in the ground or secured to the side of a boat, for example. Adjustment of the fasteners regulates rotational freedom of the legs relative to the mounting member, permitting the pole, held in the framework, to pivot arcuately relative to the stationary mounting member. During such pivoting action portions of the framework are torsionally loaded to resiliently resist the pivoting action and thereby urge the pole toward a central or neutral position. A generally U-shaped arm having a looped portion and an open throat receive the handle or butt end of the pole for maintaining the latter in the holding device.

3,593,950

CORD STRAIN RELIEF DEVICE

Heinrich F. Tetzlaff, St. Paul, Minn., assignor to Toro Manufacturing Corporation, Minneapolis, Minn.

Filed Oct. 15, 1968, Ser. No. 767,783
Int. Cl. F16l *3/14*
U.S. Cl. 248—52 4 Claims



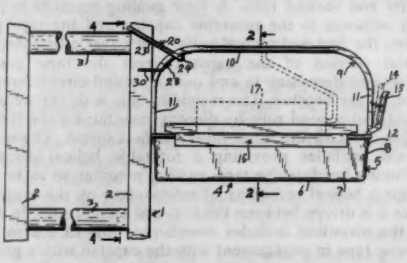
A device for suspending a cord such as an electric cord from a support to prevent straining and premature failure of the cord. The device consists of a flat elongate flexible member which is wrapped around the cord and secured thereto so as to prevent relative movement therebetween by means of a slot formed in one end thereof, which slot receives the other end of the member, with detent means formed in the member so that when the member is in enclosing supporting relationship with the cord, the detent means engages the portion of the member defining said slot to hold the member on the cord. The outer end portion of the end which is inserted in the slot is provided with an opening for connection to the cord supporting member.

3,593,951

PAINT TRAY AND MOUNTING MEANS THEREFOR

Frederick P. Warner, Eden Prairie, and Yoshimi Matsuura, Minneapolis, both of, Minn., assignors to Warner Manufacturing Company, Minneapolis, Minn.

Filed Mar. 16, 1970, Ser. No. 19,661
Int. Cl. E06c *7/14*
U.S. Cl. 248—210 5 Claims



An open topped tray having means for supporting the same in a generally horizontal position on a ladder and including a generally U-shaped member having a pair of parallel legs and

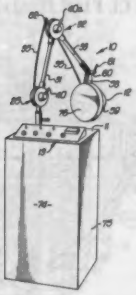
an intermediate connecting portion. The U-shaped member is adapted to straddle a ladder side rail with one of the legs being disposed in overlying engagement with a ladder rung and having an angularly displaced foot for hooking engagement with the ladder side rail.

3,593,952

SPRING BIASED SUPPORT FOR ELECTROTHERAPEUTIC APPARATUS ARTICULATED ARM STRUCTURE

James Robert Smith, Granada Hills, Calif., assignor to Dynapower Systems Corporation of California, Santa Monica, Calif.

Filed Nov. 13, 1969, Ser. No. 876,343
Int. Cl. F16l 27/00
U.S. Cl. 248—284 8 Claims



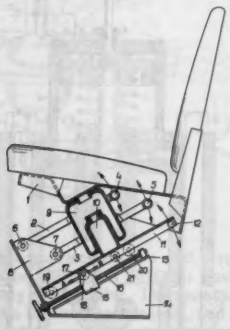
An articulated arm structure is supported by a cabinet and supports an electrotherapeutic treatment head; the arm structure includes first and second cup-shaped joint members interconnected to define a horizontal axis of relative rotation; a first torsion spring extends within the members to yieldably resist arm structure articulation while blocking collapse of the arm structure and head when projecting generally horizontally; and there may be third and fourth cup-shaped joint members connected to define another horizontal axis of rotation, and containing a second torsion spring connected to yieldably resist arm structure articulation while blocking collapse of the arm structure and head when projecting generally horizontally.

3,593,953

VEHICLE SEATS WITH AIR-SPRING SUPPORTS

Adolf Auer, Munich, Germany, assignor to Bremshey & Co., Solingen-Ohligs, Germany

Filed Jan. 8, 1969, Ser. No. 789,696
Int. Cl. F16m 13/00
U.S. Cl. 248—400 7 Claims



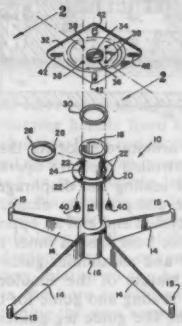
A vehicle seat and a support therefor. The vehicle seat is supported by an air-spring assembly which yields when the driver or a passenger occupies the seat. The air-spring is capable of having its natural frequency adjusted, and this adjustment is brought about by way of swing-lever which is pivotally connected at one end to the frame of the seat and which is directly connected to the air-spring at a location situated at a distance from the pivotal connection to the seat which determines the length of one lever arm. A fulcrum member is shiftable along the swing-lever to a selected location which will determine a second lever arm. The ratio of the first to the second lever arm determines the natural frequency of the air-spring.

3,593,954

SWIVEL CONNECTION FOR A CHAIR

Francis W. Ritchie, and Connie W. Garber, both of Peru, Ind., assignors to Kofabco, Inc., Peru, Ind.

Filed June 4, 1970, Ser. No. 43,409
Int. Cl. F16m 13/00
U.S. Cl. 248—425 9 Claims



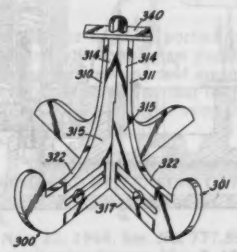
A base for a swivel chair comprising an upstanding hollow support column providing, at its upper extent, a peripherally and outwardly extending lip, a retainer ring mounted on the column for movement upwardly toward the lip, a pair of lubricous bearing rings, one ring being disposed concentrically about the column to engage the underneath surface of the lip and the other ring resting concentrically on the upper surface of the lip, a seat mounting plate providing a generally centrally disposed locator portion extending downwardly through the upper bearing ring and into the upper portion of the column, and fastening means for connecting the retainer ring and the mounting plate together to hold the bearing rings respectively against the lower and upper surfaces of the lip.

3,593,955

BOOK HOLDER

Hobart M. Hind, 122 Court Ave., Albany, Ga.

Filed May 29, 1968, Ser. No. 733,025
Int. Cl. A47b 19/00
U.S. Cl. 248—448 5 Claims



A book holder formed of intersecting support members having upper surfaces for supporting one or a plurality of

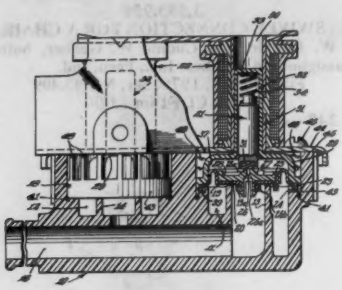
books in opened upright position for reading. The modifications include extensions for receiving a larger book and a pivot table on which the book holder rests.

3,593,956

SHUTOFF VALVE AND ARMATURE GUIDE THEREFOR

William R. McCarty, Jr., Skokie, Ill., assignor to The Dole Valve Company, Morton Grove, Ill.

Filed Apr. 16, 1969, Ser. No. 816,714
Int. Cl. F16k *31/385, 7/12*
U.S. Cl. 251—30 8 Claims



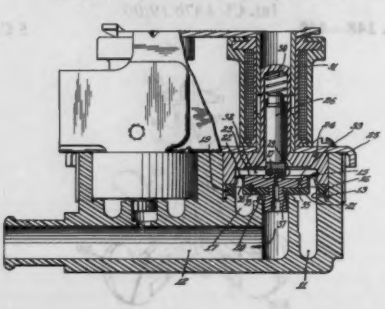
Thermoplastic armature guide for the spring and armature of a solenoid controlled pressure operated diaphragm valve, for retaining and sealing the diaphragm to the body of the valve. The guide comprises an elongated cylindrical guide part having one closed end and an opposite inverted bowllike base. The bowllike base has an inner radially outwardly extending shoulder and an annular guide leg extending axially from the outer margin of the shoulder. The shoulder and guide leg form a sealing and guide for the peripheral portion of the diaphragm. The guide leg guides the diaphragm to its cavity in the valve body and accommodates the shoulder to compress and seal the peripheral portion of the diaphragm to the valve body, as the cover plate for the valve body is tightened into position. The top wall of the inverted bowllike base is abutted by the cover of the valve body, as the shoulder maintains the diaphragm in sealing engagement with the valve body. The solenoid coil for the valve has sleevelike poles pieces fitting along the plastic armature guide to reinforce and prevent distortion of the guide by the heat of the water or the heat generated by the coil.

3,593,957

DIAPHRAGM ASSEMBLY FOR PRESSURE OPERATED PILOT CONTROLLED SHUTOFF VALVE

Paul A. Dolter, Roselle; William R. McCarty, Jr., Skokie, and Wesley S. Swanson, Elk Groove Village, all of, Ill., assignors to Eaton Yale & Towne, Inc., Cleveland, Ohio

Filed Aug. 15, 1969, Ser. No. 850,572
Int. Cl. F16k *31/385, 31/40*
U.S. Cl. 251—30 10 Claims



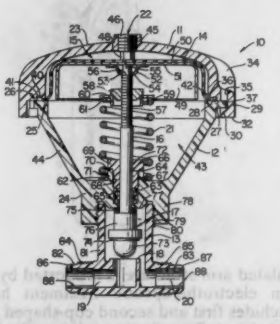
Fluid pressure operated pilot controlled diaphragm valve. The diaphragm forming the valve has a marginal sealing portion, an annular thin-walled bellowslike portion extending radially inwardly of the sealing portion and a disclike central portion extending inwardly of the thin-walled bellowslike portion. A plastic insert rigidly backs up the disclike portion of the diaphragm and has a guide boss leading through the disclike portion of the diaphragm, having a central pilot orifice leading therethrough. The insert has a bleed hole of smaller cross-sectional area than the cross-sectional area of the pilot orifice leading therethrough. The diaphragm has a series of bleed holes leading therethrough. A communicating passageway is provided between the bleed holes in the disclike portion of the diaphragm and the bleed hole leading through the plastic insert. The bleed holes leading through the diaphragm serve as a screen to prevent dirt from clogging the bleed hole leading through the plastic insert.

3,593,958

PNEUMATICALLY OPERATED VALVE MEANS AND PARTS THEREFOR OR THE LIKE

Klaus P . Mueller, Goshen, Ind., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 6, 1969, Ser. No. 831,043
Int. Cl. F16k *31/12*; F16i *3/00*
U.S. Cl. 251—61.4 12 Claims



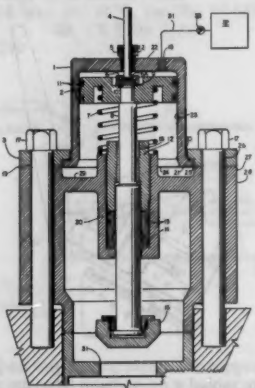
A pneumatically operated device having a pair of cup-shaped housing members provided with cam-locking means at the respective open end of the housing members to secure the open ends together in compressed relation therebetween, a flexible diaphragm having an outer peripheral means disposed between the compressed-together open ends of the housing members so that the diaphragm means is sealed thereto and cooperates with one of the housing members to define a chamber therebetween. The flexible diaphragm is operatively associated with a valve member for controlling the opening and closing of a valve seat means detachably carried by one of the housing members.

3,593,959

POCKET UNLOADER VALVE OPERATOR

Bobby Howard Greene, Rte. 2, Malvern, Pa.

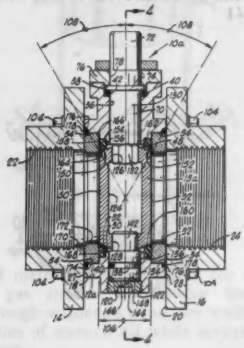
Filed July 23, 1969, Ser. No. 852,527
Int. Cl. F16k *31/143*
U.S. Cl. 251—63.6 1 Claim



A simplified, compact, inexpensive, add-on pneumatic operator with cylinder and piston for pneumatically opening

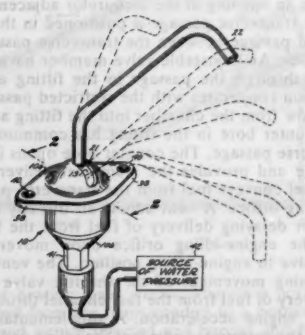
and closing pocket unloading valves on reciprocating gas compressors. Provision is made for utilizing existing stems, packing, and valves of hand-operated units, existing attachment bolt locations. Simplified self-alignment is built in, and provision included for venting any compressed gas and/or operating air leakage.

3,593,960
DISC VALVE WITH UPSTREAM AND DOWNSTREAM SEATS
Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla.
Filed May 9, 1969, Ser. No. 823,378
Int. Cl. F16k *1/226*
U.S. Cl. 251—306 **8 Claims**



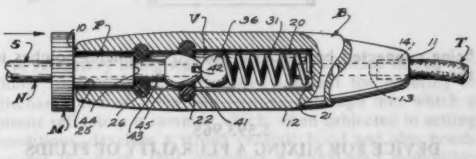
A disc valve having seating surfaces formed on both the upstream and the downstream faces of the disc which sealingly mate with respective upstream and downstream seats disposed in the valve body when the valve is in a closed position. Various forms of valve seats are disclosed. Various methods of supporting and rotating the disc in the valve body are also disclosed.

3,593,961
FAUCET FOR PRESSURIZED FLUIDS
Anthony F. Stewart, 12091 Nieta Drive, Garden Grove, Calif.
Filed May 21, 1969, Ser. No. 826,386
Int. Cl. F16k *31/58*
U.S. Cl. 251—349 **11 Claims**



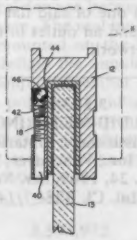
A faucet which comprises a valve and a spout, the spout being adapted to be shifted to different positions effecting opening and closing of the valve. The spout is connected to the ball portion of a ball-and-socket joint, and in communication with a diametrical passage or canal through the ball. A spherical plug is mounted in a cage adjacent the inlet end of the canal, so that the inlet fluid pressure may force the plug against the inlet to block the same when the ball is in a shutoff position at which such inlet is aligned with the cage. When the spout is actuated to pivot the ball to a flow position, at which the ball inlet is not aligned with the cage, the plug is rolled off the ball and therefore may not block the canal.

3,593,962
VALVE-CONTROLLED ROTARY NOZZLE
Gerald L. Sullivan, c/o D. L. Crawford, D.D.S. 213 E. Las Tunas Drive, San Gabriel, Calif. 91775
Filed Nov. 4, 1968, Ser. No. 772,945
Int. Cl. F16k *31/58*
U.S. Cl. 251—353 **3 Claims**



A manually operable valve-controlled fluid applicator with an elongate fluid-conducting handle fixed to a flexible fluid supply tube, and an elongate fluid-conducting stem with an outer, laterally disposed nozzle end, an inner plunger portion, the plunger portion and an intermediate laterally projecting finger-engaging portion, the plunger portion engaged in a bore in the body for free rotation and axial shifting, valve means in the body controlling the flow of fluid therethrough and into the stem and adapted to be opened and closed by axial shifting of the stem relative to the handle and sealing and retaining means in the bore to seal with the stem and normally yieldingly retaining the stem engaged in the bore.

3,593,963
MOUNTING MEANS
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed Apr. 16, 1970, Ser. No. 28,999
Int. Cl. E04h *17/16*
U.S. Cl. 256—24 **9 Claims**

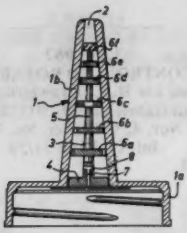


Means for attaching the handrail portion of a combined handrail and glass panel unit to the glass panel. The handrail overlies and embraces the glass and said means are actuated from beneath the handrail portion so that they would not be apparent to the eye of one observing or using the railing unit.

3,593,964
MIXING AND DISPENSING CAP
Bruno Morane, Paris, France, assignor to L'Oreal, Paris, France
Filed Nov. 21, 1968, Ser. No. 777,598
Claims priority, application France, May 7, 1968, 150,763
Int. Cl. B01f *15/00*
U.S. Cl. 259—4 **5 Claims**

Cap for mixing and dispensing a plurality of liquids, com-

prising a conical casing and a succession of transverse discs spaced axially of the casing, the spaces between the discs



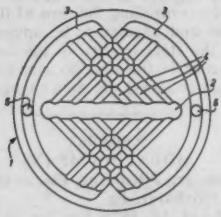
being connected by angularly spaced peripheral notches in the discs.

3,593,965

DEVICE FOR MIXING A PLURALITY OF FLUIDS WHICH ARE TO BE SIMULTANEOUSLY DISPENSED

Bruno Morane, Paris, France, assignor to L'Oreal, Paris, France

Filed Nov. 21, 1968, Ser. No. 777,602
Claims priority, application France, May 8, 1968, 150,909
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **6 Claims**



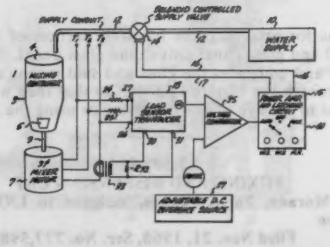
A mixer for a plurality of fluids comprising a disc sandwiched between two flat surfaces, said disc being provided on both sides with a network of intersecting grooves passageways through said disc connecting the two networks of grooves, an inlet in one of said flat surfaces affording access to one network, and an outlet in the other surface connected to the other network.

3,593,966

ADDED-FLUID-METERING SYSTEM

Lonnie E. Munroe, Mississauga, Ontario, Canada, assignor to Columbia Machine, Inc., Vancouver, Wash.

Filed Sept. 24, 1969, Ser. No. 860,637
Int. Cl. B28c *7/14*
U.S. Cl. 259—168 **9 Claims**



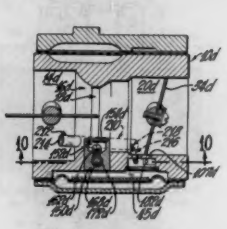
A system for monitoring and controlling the addition of water to dry concrete mix. The water is added through a solenoid-controlled supply valve to a truck-mounted mixing container rotatable by a three-phase AC motor. The power consumption of the motor, which decreases as water is added to the mix, is monitored by a load sensor transducer which produces a related DC control signal. A voltage comparator and latching circuit are provided to deenergize the solenoid and stop water flow when the DC control signal voltage equals a precalibrated DC reference voltage.

3,593,967

DIAPHRAGM CARBURETOR HAVING FUEL CHANNEL SYSTEM FOR ENGINE IDLING AND ACCELERATION

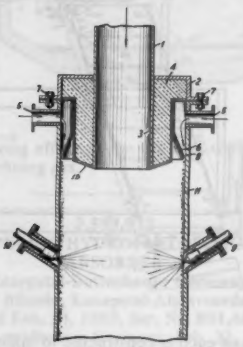
Warren D. Nutten, Toledo, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of application Ser. No. 636,966, May 8, 1967, now abandoned. This application Nov. 28, 1969, Ser. No. 876,188
Int. Cl. F02m *3/02, 17/04, 7/06*
U.S. Cl. 261—41 **4 Claims**



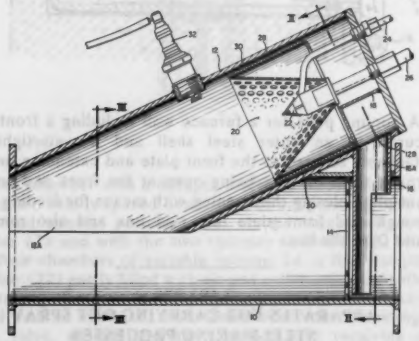
An aspirated type of diaphragm carburetor embodying a channel system accommodating fuel for delivery into the mixing passage for engine-idling purposes and for engine acceleration wherein upon closing of the throttle valve to engine-idling position, delivery of fuel for engine-idling purposes is delayed whereby the engine operates for a short period of time on residual fuel in the crankcase before the idling system delivers fuel for engine idling, and upon opening of the throttle valve, the fuel in the idling channel system is delivered into the mixing passage through a main orifice for accelerating engine operation. The carburetor includes an unvented fuel chamber with a flexible diaphragm forming a wall of the fuel chamber. The chamber includes a valved fuel inlet with a lever transmitting movement of the diaphragm to the inlet valve. A fuel passage is disposed between the fuel chamber and the region of the main orifice. A fitting is disposed in an opening of the carburetor adjacent the mixing passage. A transverse passage is positioned in the fitting and a restricted passage between the transverse passage and the fuel chamber. An adjustable valve member having a portion projecting through the passage in the fitting and a needle valve portion cooperates with the restricted passage to regulate fuel flow from the chamber into the fitting and main orifice. A counter bore in the fitting has communication with the transverse passage. The counter bore opens into the mixing passage and provides the main fuel delivery orifice. A fuel channel conveys fuel from the transverse passage to an engine-idling orifice. A vent admits air directly into the fuel channel for delaying delivery of fuel from the fuel channel through the engine-idling orifice upon movement of the throttle valve to engine-idling position. The vent is effective upon opening movement of the throttle valve to promote rapid delivery of fuel from the fuel channel through the main orifice for engine acceleration. A supplemental chamber is located in the carburetor adjacent the idling orifice. The fuel channel includes a bore and an elongated channel is disposed normal to the bore. The elongated channel comprises a recess in an exterior surface region of the carburetor. A gasket covers the recess forming a wall of the elongated channel. One end region of the elongated channel opens into the bore. An angularly arranged channel connects the elongated channel and the supplemental chamber. The air vent admits air to the angularly arranged channel to delay delivery of fuel through the idling orifice upon movement of the throttle valve to engine-idling position.

3,593,968
RAPID COOLING FOR HIGH-TEMPERATURE GAS STREAMS
Ray L. Geddes, Waban, Mass., assignor to Stone & Webster Engineering Corp, Boston, Mass.
Filed Sept. 26, 1968, Ser. No. 762,871
Int. Cl. B01d 5/00
U.S. Cl. 261—118 2 Claims



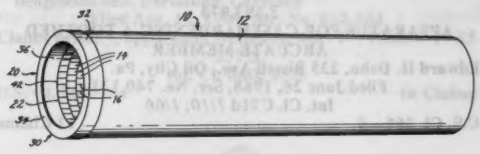
An improved method and apparatus for cooling a hot pyrolysis exit gas stream by flowing the gas stream downwardly through a quench zone, the walls of which are covered by a film of quench oil while spraying quench oil into the gas stream.

3,593,969
GAS STREAM HEATER
Harold R. Smithson, West Town, and John M. Hansen, Malvern, both of, Pa., assignors to Oxy-Catalyst, Inc., West Chester, Pa.
Filed Oct. 9, 1969, Ser. No. 865,074
Int. Cl. F23l 9/04
U.S. Cl. 263—19 A 6 Claims



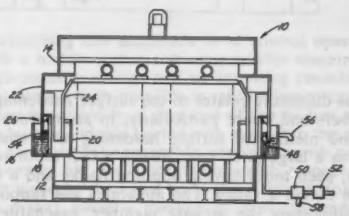
Burner for heating a gas stream wherein a portion of the gas is diverted from the main conduit to a burner tube into which fuel and air are injected and burned and from which the heated diverted gas and combustion products are reintroduced into the main conduit approximately concurrently with the stream therein. For this purpose the burner tube is disposed generally at an acute angle with respect to the axis of the main conduit and the burner tube outlet extends into said conduit. In the burner tube a baffle is provided to impart a swirling motion to the diverted gas as it enters the burner tube. The injection nozzle is surrounded by a perforated cone which is in turn surrounded by a cylindrical member with a smaller annular passageway therearound.

3,593,970
MONOLITHIC PLASTIC NOSERING
John Williams Seebald, Cranbury, N.J., assignor to General Refractories Company, Philadelphia, Pa.
Filed June 25, 1969, Ser. No. 836,373
Int. Cl. F27b 7/00
U.S. Cl. 263—33 12 Claims



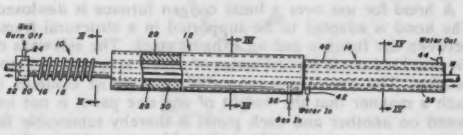
A refractory lining wall for a rotary kiln made of conventional firebrick which terminates adjacent the nosering or discharge end of a the kiln forming a trough into which a plastic refractory is rammed which, when subjected to setting conditions, develops a strong ceramic bond and also bonds against the brick, thus providing a nonjointed monolithic nosering having high resistance to mechanical and thermal spalling.

3,593,971
FLUID INFLATABLE SEAL
Calvin C. Blackman, 24272 W. Lake Road, Bay Village, Ohio
Filed July 16, 1969, Ser. No. 842,208
Int. Cl. F26b 25/00; F27d 23/00; C21d 1/12; F16j 15/46
U.S. Cl. 263—49 8 Claims



A fluid inflatable seal for use between the cover and base of a heat treating furnace. The seal includes an annular fluid-impervious member mounted on the base. Valves are provided to inflate and deflate the annular member. In the inflated position, the annular member extends between the cover and the base to provide a fluidtight seal. The casing of the member is made of a nonelastomeric material, and optionally strips of relatively yieldable material are secured to the casing to abut against both the cover and the base for good sealing characteristics.

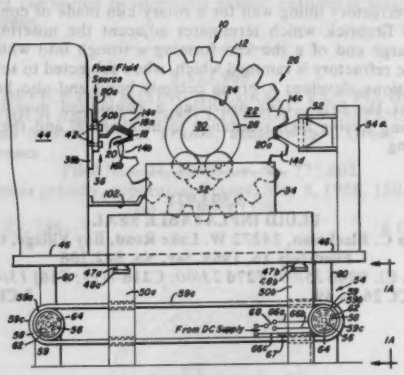
3,593,972
ANNEALING APPARATUS
John Louis Wehrle, East Troy, and Kenneth William Robinson, Lake Geneva, both of, Wis., assignors to Crucible Steel Corporation, Pittsburgh, Pa.
Filed Feb. 25, 1969, Ser. No. 802,060
Int. Cl. C21d 9/56
U.S. Cl. 266—3 13 Claims



This relates to apparatus for the continuous, in-line annealing of elongated metal workpieces, particularly stainless steel

tubing, which apparatus includes an induction-heating zone, wherein a workpiece is heated to a predetermined temperature, a soaking zone, wherein said workpiece is held at temperature and a cooling zone, wherein said workpiece is cooled to a temperature below its oxidation temperature. This apparatus provides advantages with respect to product quality and economy of operation.

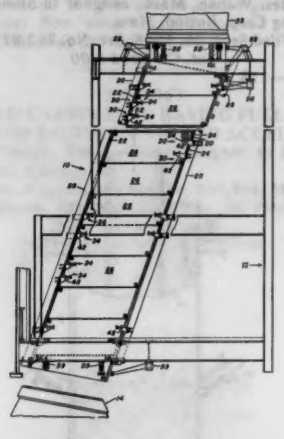
3,593,973
APPARATUS FOR CASEHARDENING A TOOTHED ARCUATE MEMBER
Edward H. Dehn, 235 Bissell Ave., Oil City, Pa.
Filed June 26, 1968, Ser. No. 740,131
Int. Cl. C21d *1/10, 1/66*
U.S. Cl. 266—4 **12 Claims**



This disclosure relates to the surface hardening of arcuate members and, more particularly, to an improved apparatus for and method of surface hardening an arcuate member, such as a large pitch gear, having a first tooth and a second tooth, each tooth having opposed flanks and a root section which define a valley. The apparatus has supporting means for supporting the arcuate member, casehardening means mounted in registry with the valley for casehardening the flanks and the root section, and drive means connected to one of the supporting means and the casehardening means to cause relative movement between the valley and the casehardening means so that the casehardening means passes through the valley. The casehardening means has preheating means generally contoured to the valley for producing a moving preheated area on the flanks and the root section, heating means adjacent the preheating means for raising the temperature of the arcuate member without burning the moving heated area, and quenching means connected to a fluid source and adjacent the heating means for quenching and casehardening the moving heated area.

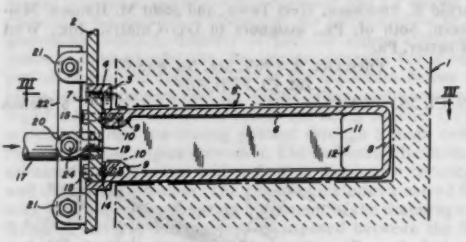
3,593,974
HOOD CONSTRUCTION
Albert B. Reid, Glenshaw, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.
Filed Jan. 10, 1969, Ser. No. 790,375
Int. Cl. C21b *7/08*
U.S. Cl. 266—31 **8 Claims**

A hood for use over a basic oxygen furnace is disclosed. The hood is adapted to be supported in a structural frame between the furnace and an exhaust stack. The sidewalls of the hood are made up of a series of panels arranged one atop another. The panels are supported on support columns in such a manner that the weight of any one panel is not imposed on another and each panel is thereby removable for replacement or repair without disturbing any of the others. Provision is also made in the manner of supporting the panels to allow for expansion and contraction of the panels without the imposition of any stresses on the supporting means which secure the panels to the support columns. The panels are



water cooled and each is constructed to maintain a generally back and forth flow of water therethrough.

3,593,975
COOLING PLATES FOR A FURNACE
Herbert A. White, Jr., 2516 Collins Road, Pittsburgh, Pa.
Filed July 12, 1968, Ser. No. 744,494
Int. Cl. C21b *7/10;* **F27b** *1/24*
U.S. Cl. 266—32 **7 Claims**

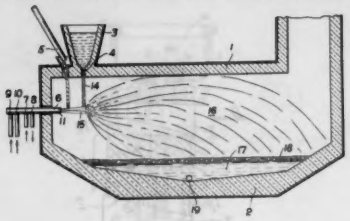


A cooling plate for a furnace wall including a front plate secured to an outer steel shell and a watertight box detachably secured to the front plate and extending into the furnace wall, the box being open at the front end and the front plate closing the opening with means for feeding water through said front plate into said box and also removing water from the box.

3,593,976
APPARATUS FOR CARRYING OUT SPRAY STEELMAKING PROCESSES
Alois Hager, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria
Filed Apr. 15, 1969, Ser. No. 816,241
Claims priority, application Austria, May 13, 1968, A 4,568/68
Int. Cl. C21c *7/00*
U.S. Cl. 266—35 **9 Claims**

A spray apparatus is provided comprising a collecting vessel having a vertical inlet passage through which a stream of pig iron is fed by a free fall and a multihole blow pipe arranged inclined towards the axis of said vertical inlet passage, pressurized refining gas being supplied through the outlets of said blow pipe, said outlets being arranged in V- or U-fashion

so as to form a gas jet with a channel like cross section owing to which fact the swaying flow of the pig iron stream doe not



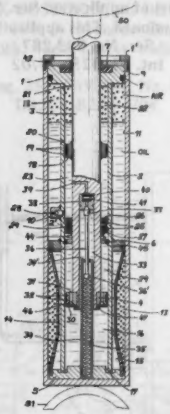
impair the spraying effect as the pig iron stream is perfectly caught by the refining gas.

3,593,977

SELF-LEVELING HYDROPNEUMATIC SHOCK ABSORBER

Erich Hahn, Ennepetal-Buttenberg, Germany, assignor to Firma August Bilstein, Ennepetal-Altenvoerde, Germany

Filed Feb. 24, 1969, Ser. No. 801,469
Claims priority, application Germany, Feb. 22, 1968, P 16 55 983.4
Int. Cl. F16f 5/00
U.S. Cl. 267—64 **10 Claims**



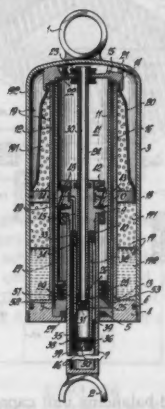
Shock absorber with a dashpot assembly whose piston (3) carries two axially spaced heads (4, 18) cooperating with an interposed annular partition (24) on the inner wall of its cylinder (2) and with the two cylinder end walls (5, 9) to form four chambers of variable volume, i.e. a first damping chamber (22) partly filled with air and communicating with a surrounding oil reservoir (11), a pumping chamber (23) connected with an inlet (10) from the oil reservoir containing a check valve, an intermediate chamber (29) receiving oil from the pumping chamber through one-way orifices (26) of the partition (24), and a second damping chamber (16) receiving oil from the intermediate chamber through one-way passages (31) in the adjoining piston head (4) while also communicating with a fluid space (15) under pressure from a surrounding air cushion (13), the latter chamber having an exit to the pumping chamber blocked by a regulating valve (38) in a contracted position of the assembly. In an extended position, in which a tube (34) rigid with the cylinder (2) opens the regulating valve (38), the pumping chamber (23) is in two-way communication with the reservoir (11) through an opening (20) unblocked by the other piston head (18). an extended position, in which a tube (34) rigid with the cylqnder ('2) opens the regulating valve (38), the pumping chamb r (23) is in two-way communication wilh the reservoir (11): THROUGH -N OPENING (20) unblocked by the other piston head (18').

3,593,978

HYDRO-PNEUMATIC SPRING SYSTEM, ESPECIALLY FOR MOTOR VEHICLES

Manfred Lohr, Letmathe, Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Germany

Filed Apr. 15, 1969, Ser. No. 816,344
Claims priority, application Germany, Apr. 17, 1968, P 17 55 237.3
Int. Cl. B60c 9/08
U.S. Cl. 267—64 **16 Claims**



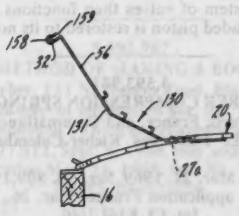
A shock absorbing and automatic level control operating cylinder with a hollow piston rod reciprocable therein and having a high-pressure storage and an operating chamber. A hollow pump rod is axially movable in said hollow piston and a pump piston is carried by a free end of the hollow pump rod. A valve body is slidably guided with respect to the pump rod and has an abutment engageable upon the pump piston. An insert member has a surface liftable with respect to a valve seat provided by the valve body and a throttle-forming bore means makes possible passage of hydraulic medium from the high-pressure storage into the operating chamber. A preloaded tension spring means presses upon a surface of the insert member for interrupting pump operation. Additional check valves are provided for opening of high-pressure storage and for making possible pump operation.

3,593,979

EDGE SPRING ARRANGEMENT

Lawton H. Crosby, Lake Bluff, Ill., assignor to Morley Furniture Company Inc., Chicago, Ill.

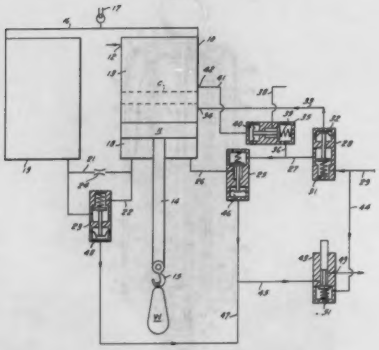
Continuation-in-part of application Ser. No. 697,868, Jan. 15, 1968, now abandoned. This application Aug. 13, 1969, Ser. No. 858,240
Int. Cl. A47c 23/16, 23/24
U.S. Cl. 267—102 **15 Claims**



A spring edge arrangement for a seat assembly where the seat assembly includes a sinuous spring band. A cantilever

arm member has an attachment section which anchors at its inner end onto at least two linear wire segments of the band and a cantilever section which extends away from the attachment section to terminate in a border wire-retaining mouth plumbed over the front rail of the seat assembly.

3,593,980
PNEUMATIC BALANCER
Kenneth A. McHenry, Clinton, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.
Filed Apr. 21, 1969, Ser. No. 817,764
Int. Cl. F16f 9/32
U.S. Cl. 267—126 **8 Claims**

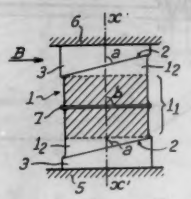


A pneumatic load-balancing unit capable of automatically balancing pneumatically at a specific level any weight within the capacity of the unit following manual actuation of a control valve connected with a pressure air supply; and to allow this weight to be manually moved or floated with predetermined ease above and below the balance level within the stroke range of a piston carrying the weight. The unit includes a cylinder containing the piston upon the rod of which the weight is attachable. Air pressure in a reservoir connected in a closed circuit with the cylinder functions to counterbalance the weight-loaded piston. Since the level of the piston will change with a change in the weight load, then in order to return the work-loaded piston to its normal level, the control valve is manually opened. A system of valves automatically responds to pressure airflowing through the control valve to either admit increased pressure air or to relieve pressure air from the closed circuit as needed to return the piston to its normal balance level. The pressure in the closed circuit remains constant following restoration of the piston to its normal balance level and release of the control valve. The closed circuit normally permits free airflow between the cylinder and the reservoir except when the system of valves is caused to function, then it provides a restricted flow. The restricted flow develops back pressure which functions to snub movement of the piston so as to aid in bringing the piston to a stabilized condition.

In a modified form, an arrangement between the control valve and the system of valves requires only a momentary opening of the control valve so as to initiate operation of the system of valves, after which the control valve may be released. The system of valves then functions automatically until the work-loaded piston is restored to its normal level.

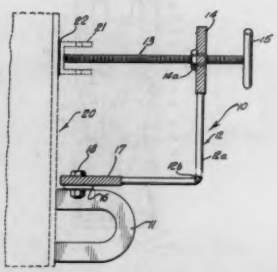
3,593,981
RUBBER COMPRESSION SPRINGS
Joachim Tank, Paris, France, and Pneumatiques, Caoutchouc Manufacture Et Plastiques Kleber-Colombes, Colombes, France
Filed Mar. 21, 1969, Ser. No. 809,193
Claims priority, application France, Mar. 26, 1968, 145,514.
Int. Cl. F16f 1/40
U.S. Cl. 267—153 **7 Claims**

This invention relates to rubber compression springs, of the kind in which at least one rubber block is fixed at its ends to bearing surfaces which are inclined with respect to the longitudinal axis of the block so that the block supports the load whilst functioning primarily in compression. In accordance with the invention, the block is subdivided by one



or more intermediate plates which are inclined to the axis of the block at an angle greater than that of the bearing surfaces. This arrangement allows the lateral rigidity of the spring to increase when the spring is compressed, at least in a transverse direction.

3,593,982
CLAMPING APPARATUS AND METHOD OF USE THEREOF
Walter Doil Price, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.
Continuation-in-part of application Ser. No. 634,381, Apr. 27, 1967, now abandoned. This application July 11, 1969, Ser. No. 843,287
Int. Cl. B25b 11/02
U.S. Cl. 269—8 **5 Claims**

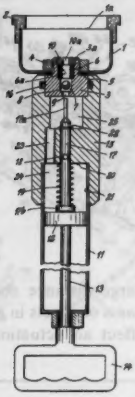


An L-shape clamping apparatus with magnetic means for attachment to a magnetizable structure at one end thereof and a tension member at the other end thereof for holding an object against the structure to which it is to be fastened by adhesive means, and method of use thereof.

3,593,983
DEVICE FOR HOLDING FITTINGS ON CONCRETE FORMWORK
Zoltan Csenyi, Bahnhofstrasse 161, 8902 Urdorf, Switzerland
Filed Apr. 7, 1969, Ser. No. 813,972
Claims priority, application Switzerland, May 22, 1968, 7793/68
Int. Cl. B25b 11/00
U.S. Cl. 269—21 **17 Claims**

A system for mounting cup-shaped holders for fittings to be built into concrete bodies along the internal surface of concrete formwork. The device comprises an opening in the mounting shell in which a valve body is frictionally received, the valve body being thrust in place by a plunger and tappet

on a device applied over the opening. The device may be connected with a suction pump by a hose or the like or may



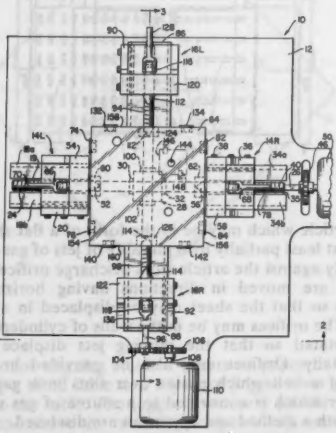
employ a piston pump for operating the tappet and providing suction.

3,593,984

WORK-POSITIONING DEVICES

Jerry K. Carman, 444 S. Monroe St., Xenia, Ohio, and Ronald E. Meredith, 4360 Lower Valley Pike, Springfield, Ohio

Filed Aug. 25, 1969, Ser. No. 852,763
Int. Cl. B23q *1/04*
U.S. Cl. 269—71 14 Claims



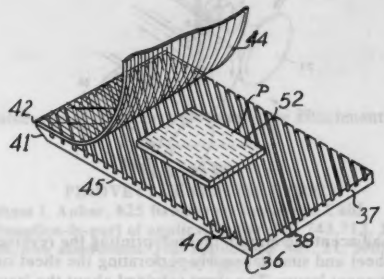
A work-positioning device which enables a workpiece supported thereon to be universally accessible to a working tool. First and second pairs of slide units are slidably mounted on a base of the device, and the slide units of each pair are moved towards and away from each other by threaded screws. A work table, to which a workpiece is secured, has locating holes thereon which cooperate with pivot pins and locking pins on each of the slide units, enabling the workpiece to be held in various positions relative to a working tool. A workpiece, like a cube, may have machining work done on its six faces by the tool without being removed from the device.

3,593,985

CARRIER FOR A SKIN GRAFT PATCH

James C. Tanner, Jr., c/o Atlanta Research Institute, Suite 705, 384 Peachtree St. N.E., Atlanta, Ga.

Division of Ser. No. 439,811, Mar. 15, 1965, Pat. No. 3,472,228.
Filed June 3, 1969, Ser. No. 830,019
Int. Cl. A61g *13/00*; B23q *27/00*
U.S. Cl. 269—288 2 Claims



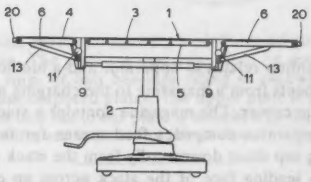
Carrier for a skin graft patch including a base member having parallel side edges and a plurality of grooves defining a plurality of spaced, substantially parallel and flattened lands, said grooves being obliquely disposed with respect to said side edges. The carrier also includes a cover sheet of thin material for retaining a patch of skin in a position across said lands.

3,593,986

OPERATION TABLES

Norman John Lee, London, England, assignor to Matburn (Holdings) Limited, London, England

Filed May 15, 1969, Ser. No. 824,851
Claims priority, application Great Britain, May 28, 1968, 25385/68
Int. Cl. A61g *13/00*
U.S. Cl. 269—325 4 Claims



A surgical operation table has a patient-supporting platform with an extension flap at one end. The flap is removably fitted to the platform. The flap has coupling blocks or wedges on opposite sides at an end proximate the platform end. These blocks or wedges are engageable in mating coupling sockets on opposite sides of the platform. Locking means, such as a locking screw are provided to lock the blocks or wedges against accidental removal from the sockets.

3,593,987

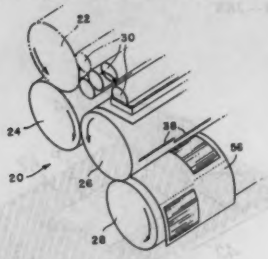
METHOD OF MAKING A BOOK

Bernard J. Garber, 151 N. Moison Road, Blauvelt, N.Y.

Continuation-in-part of application Ser. No. 756,712, Aug. 7, 1968, now abandoned , which is a continuation of application Ser. No. 577,411, Sept. 6, 1966, now abandoned. This application Mar. 11, 1968, Ser. No. 712,199
Int. Cl. B41f *13/56*
U.S. Cl. 270—21 5 Claims

A method of making a book having both permanent and nonpermanent or removable leaves. The method comprises the steps of providing a plate for printing a plurality of leaves

of a book on a first side of a sheet; printing the leaves on the first side of the sheet; providing a plate for printing a plurality of leaves of a book on the reverse side of the sheet; providing a plurality of perforating members for perforating the plurality of leaves on the sheet which are to be nonpermanent adjacent the margin thereof; printing the reverse side of the sheet and simultaneously perforating the sheet on the nonpermanent leaves. The sheet is folded about the leaves to form a signature. Finally, a plurality of signatures are bound together and are cut together to form a book.



3,593,988

SHEET-FEEDING ARRANGEMENTS

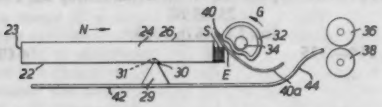
Collins, Reginald, Potters Bar, England, assignor to Omal Group Limited, London, England

Filed Aug. 27, 1968, Ser. No. 755,607

Claims priority, application Great Britain, Sept. 14, 1967, 42,052/67

Int. Cl. B65h *3/06*

U.S. Cl. 271—39 **9 Claims**



The invention relates to apparatus and a method for feeding copy sheets from a magazine to the charging means of an electrostatic copier. The magazine contains a stack of sheets and the apparatus comprises feed means for feeding each succeeding top sheet downwardly from the stack at an acute angle to a leading face of the stack across an edge of the stack so that the top sheet bows upwardly away from the next sheet in the stack to minimize the risk of adhesion between the top sheet and the next sheet as the top sheet leaves the magazine.

3,593,989

TURNED CORNER AND MULTIPLE SHEET DETECTOR

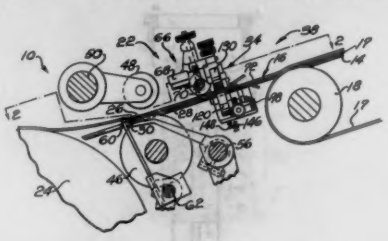
Charles B Crittenden, Chagrin Falls, and Alfred J. Stains, Shaker Heights, both of, Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 11, 1969, Ser. No. 806,100

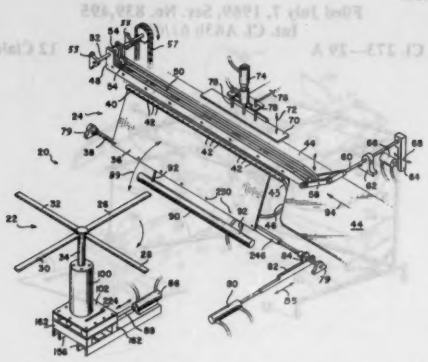
Int. Cl. B65h *7/06*

U.S. Cl. 271—57 **10 Claims**

An improved apparatus for feeding sheets into an assembly for operating on the sheets, such as a printing press or cutting and creasing machine, includes a side guide assembly and a detector assembly. The side guide assembly positions the sheets transversely to the direction of flow. The detector assembly is mounted on the side guide assembly and detects thicknesses of sheets in excess of a predetermined thickness to thereby detect the presence of a folded corner on a sheet or a number of sheets in excess of a predetermined number. To minimize false or erroneous actuations of the detector assembly due to vibrations and other causes, the detector assembly includes a detector wheel or member which is rotated through a relatively large distance about fixed axis by engagement with a thickness of sheets in excess of the predetermined thickness to effect an actuation of the detector assembly.

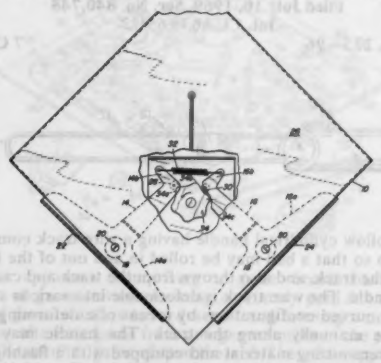


port member. The movable member has means for producing suction. The suction means acts to secure the articles to the



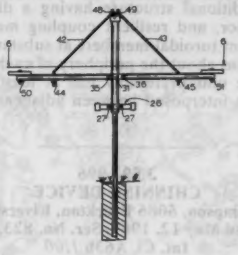
movable member as the movable member transports the articles from the output station to the support member.

3,593,992
PAPER JOGGER
Walter J. Hanson, Old Greenwich, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Apr. 23, 1969, Ser. No. 818,536
Int. Cl. B65h *31/38*
U.S. Cl. 271—89 10 Claims



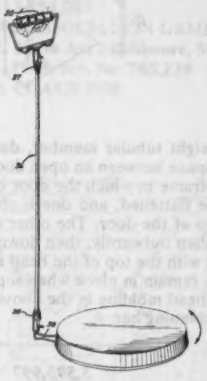
A jogger for aligning stacked sheets of paper or the like comprising a tilted table and a pair of jogger arms pivotally mounted to the table. The jogger arms carry paddle portions which extend above the tabletop along two adjacent sides of the table. Followers on each arm are operatively engaged by a multilobed cam which causes the arms and associated paddles to pivot in synchronism and bring into alignment sheets stacked on the tabletop. A prop may be provided on the tabletop to facilitate the alignment of cross-stacked sheets.

3,593,993
ROTATABLE GARBAGE CAN RACK AND CHILD AMUSEMENT RIDE ATTACHMENT
John H. Bonneau, 6604 Bavarian Drive, Mobile, Ala.
Filed Aug. 6, 1969, Ser. No. 847,940
Int. Cl. A63g *1/00*
U.S. Cl. 272—33 R 1 Claim



A rotatable uppermost portion of a garbage can holder is adapted to support either the garbage can handles or a rotatable, removable merry-go-round-type attachment.

3,593,994
PIROVETTE EXERCISE DEVICE
Abraham I. Anbar, 625 Broadway, San Diego, Calif.
Continuation-in-part of application Ser. No. 743,713, July 10, 1968, now abandoned. This application Nov. 21, 1968, Ser. No. 777,853
Int. Cl. A63b *21/00*
U.S. Cl. 272—57 8 Claims



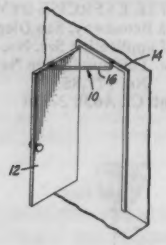
An exercise device comprising a platform adapted to pivot about a base. The platform and base pivot by means of two concentric rings of ball bearings riding in raceways formed from two superimposed plates. The upper plate is attached to the platform and the lower plate is attached to the base. One or more handles are attached to the device.

3,593,995
SPRING-COUPLED RINGS FOR AMUSEMENT
Robert J. Eckstrom, 8709 Able St. N.E., Minneapolis, Minn.
Filed Oct. 1, 1969, Ser. No. 862,691
Int. Cl. A63b *19/00, 23/02, 21/00*
U.S. Cl. 272—57 7 Claims

Amusement and agility-developing means comprising a plurality of generally circular toroidal structures including a

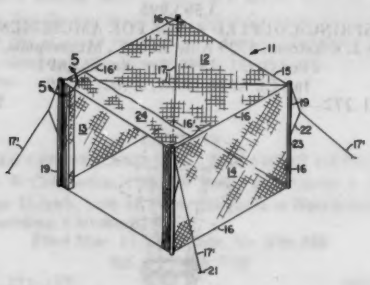
first generally toroidal member having a certain predetermined diameter and a number of additional toroidal structures, each additional structure having a diameter greater than its neighbor, and resilient coupling means interposed between adjacent toroidal members at substantially equal arcuate dispositions about the periphery of each of the toroidal structures. The unit preferably has at least three resilient coupling means interposed between adjacent toroidal members.

3,593,996
CHINNING DEVICE
Thomas R. Thompson, 6086 Brockton, Riverside, Calif.
Filed May 12, 1969, Ser. No. 823,861
Int. Cl. A63b *1/00*
U.S. Cl. 272—62 **4 Claims**



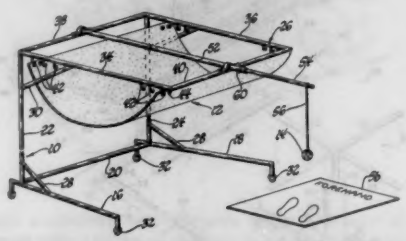
A lightweight tubular member, designed to fit diagonally across the space between an open door and the head molding of the doorframe in which the door is hung. The ends of the member are flattened, and one is shaped to extend up and over the top of the door. The other end is shaped to extend upwardly, then outwardly, then downwardly into down-bearing contact with the top of the head molding. The member is designed to remain in place when supported on the door and doorframe head molding in the above-indicated manner, and serve as a chinning bar.

3,593,997
BASEBALL-BATTING CAGE
Douglas L. Boehner, Santa Cruz, Calif., assignor to Port-O-Net Inc., Santa Cruz, Calif.
Filed Apr. 4, 1969, Ser. No. 813,619
Int. Cl. A63j *5/00*
U.S. Cl. 273—26 **13 Claims**



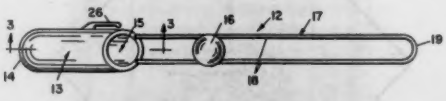
A sport practice cage is disclosed enclosed on top, back and sides and with slidable front panels for defining selectable obstructed and unobstructed regions in the front of the cage. A corner post and rope-tensioning panel support structure is disclosed with a corner member for connection of ropes on three mutually perpendicular axes.

3,593,998
TENNIS PRACTICE DEVICE
Louis W. Pattyn, 874 Barrington Drive, Gross Pointe Park, Mich.
Filed July 7, 1969, Ser. No. 839,495
Int. Cl. A63b *61/00*
U.S. Cl. 273—29 A **12 Claims**



Indoor tennis practice apparatus including a hollow unpressurized ball hung on an inelastic tether from an overhead support to be stroked toward an energy-absorbing target including a pliable fabric rectangle having two opposite edges freely suspended from the overhead support along spaced parallel lines to form a draped catenary surface. Both the horizontal spacing between the suspended edges of the fabric rectangle and the horizontal spacing between the target and the ball are adjustable to vary the character of the rebound after the ball is struck. The support can take the form of a single or double target stand or a simple beam structure for home installation.

3,593,999
BALL ROLLING, THROWING AND CATCHING TOYS
Norbert A. Kirk, 3915 N. Pine Grove Ave., Chicago, Ill.
Filed July 10, 1969, Ser. No. 840,748
Int. Cl. A63b *65/12*
U.S. Cl. 273—96 **7 Claims**

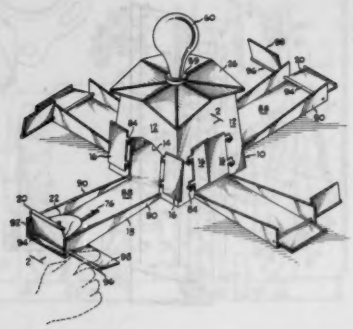


A hollow cylindrical handle having a wire track connected thereto so that a ball may be rolled in and out of the handle along the track, and also thrown from the track and caught in the handle. The wire track is deformable into various straight and/or curved configurations by means of a deforming block slidable manually along the track. The handle may be of light-transmitting material and equipped with a flashlight for illuminating a variable length of the handle which is not blocked by presence of the ball therein. Also, the handle may be apertured to emit a whistling sound as the ball moves in and out of the handle.

3,594,000
REACTION GAME APPARATUS
Marvin I. Glass, Chicago, and Howard J. Morrison, Highland Park, both of, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed May 10, 1969, Ser. No. 805,685
Int. Cl. A63f *9/00*; **A61b** *5/16*
U.S. Cl. 273—108 **9 Claims**

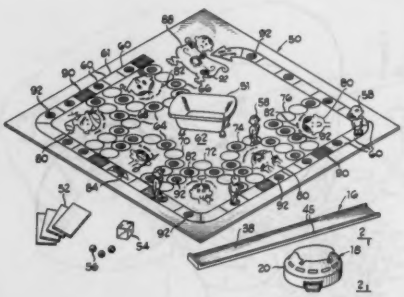
Game apparatus comprising a central housing structure enclosing a movable game member in a biased and latched position on a platform rotatable about a vertical axis which may be selectively aligned with any of a number of openings defined by the housing walls. Each of the openings is provided with a door. A combined sounder, game member release and platform rotator is secured to the housing. Paths extend from each of the openings for traversion by the game

member. At the end of each path is a pivoted gate member, and a player positioned at the end of each path must stop the game member should it be released from its latched position



and propelled in that player's direction. Failure to stop the game member is detrimental to the player's score while a successful stop is beneficial to his score.

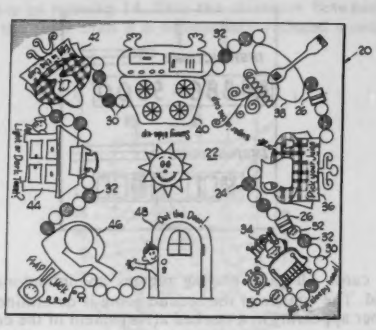
3,594,001
GAME
Marvin I. Glass, and Jeffrey D. Breslow, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Mar. 12, 1969, Ser. No. 806,573
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 B **3 Claims**



Game apparatus comprising a game board having a number of game stations forming a primary path for movement of game markers toward a goal and forming a number of longer alternate paths from one game station of the primary path to another game station thereof. The game apparatus also includes a die for determining movement of the markers along the path and a chance device in the form of means for reproducing a sound message for determining beneficial negotiation of the longer alternate paths. The object of the game is to be the only player to occupy a path station while the remaining players occupy the goal position at the end of the path. A target receptacle is disposed on the board having a constricted lower portion suitable for receiving only the first of several projectiles thrown into the receptacle by the players when a predetermined message is emitted by the sound message device.

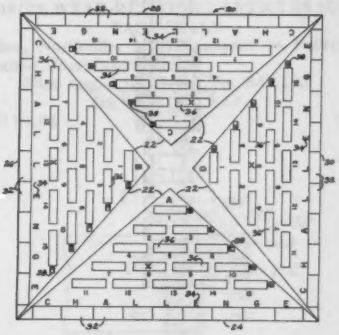
3,594,002
BOARD GAME APPARATUS
Marvin I. Glass, and Rouben T. Terzian, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Mar. 24, 1969, Ser. No. 809,558
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 B **1 Claim**

Game apparatus including a game board having a plurality of stations forming a path for movement of playing pieces and including a number of stations having three-dimensional devices associated therewith presenting different game tricks



performable by the game players. The players are expected to successfully complete each of the game tricks prior to resuming negotiation of the path toward a goal position.

3,594,003
PROGRAMMED ASSOCIATION GAME
Clarence L. Elder, 916 E. North Ave., Baltimore, Md.
Filed Oct. 4, 1968, Ser. No. 765,239
Int. Cl. A63f *3/00*
U.S. Cl. 273—135 R **5 Claims**

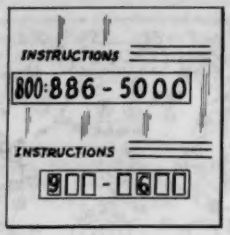


An educational, competitive, information game employing groups of two-sided playpieces, each bearing on the two respective sides different information which is related in meaning to each other and to information on other playpieces within the same group, and a display board having plural arrays of unique playing positions within a scorecard perimeter coherently keyed to the playing positions, the whole adapted in conjunction with appurtenances to motivate players to learn by playing.

3,594,004
GAME HAVING QUICK PRIZE INDICATION
William H. Barr, Carmel, and Glen L. Wesen, Brooklyn, both of, N.Y., assignors to Howard Miller, Scarsdale; David J. Waltzer, Forest Hills, N.Y. and Leonard Kaye, Westfield, N.J.
Filed Mar. 15, 1968, Ser. No. 713,492
Int. Cl. A63f *1/18*
U.S. Cl. 273—139 **1 Claim**

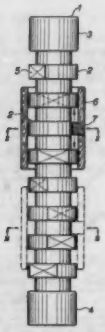
A game comprising a stacked plurality of cards, each card having two game-playing regions by which two games may be simultaneously played. Means are provided to instantaneously determine the winner of the first game. The second

game comprises zone slots having indicia or light apertures, respectively, the indicia and apertures being different for



each card. All game-playing regions are intentionally concealed. The winner of the second game is determined by the number appearing in a stacked arrangement of the cards.

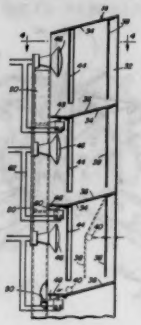
3,594,005
MAZE TOY
Jorma Vennola, Luoteisvayla 17 B, Helsinki, and Pekka Korpijaakko, Impilahdentie 14 A, Laaksolahti, both of, Finland
Filed Mar. 20, 1969, Ser. No. 808,744
Claims priority, application Finland, Feb. 4, 1969, 324/69
Int. Cl. A63f *9/08*
U.S. Cl. 273—153 R **3 Claims**



A toy comprises a stafflike body of wood, plastic, metal or other equivalent material and of a ring encircling this body. The body has several consecutive flanges with notches which are located at different points in every two consecutive flanges, and the ring encircling the body consists of a sleeve having an inner diameter consistent with the outer diameter of the flanges and an inwardly directed projection permitting axial displacement of the ring only when the projection and the notch of an adjacent flange register.

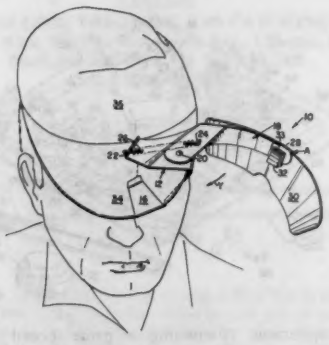
3,594,006
GOLF PRACTICE APPARATUS
Corwin Clatt, 110 Greenlawn Court, East Peoria, Ill.
Filed July 14, 1969, Ser. No. 841,452
Int. Cl. A63b *67/02, 69/36*
U.S. Cl. 273—176 **5 Claims**

This is a golf ball receiving apparatus for use with conventional golf clubs and balls. It includes a plurality of vertically and horizontally spaced compartment targets, golf ball teeing and ball chipping areas in front of the compartment targets, an identified target curtain hanging in each compartment with a light bulb therebehind, a slanted floor in each compartment behind its curtain for the ball hit against the target curtain to drop onto and then roll over a ball depressible light switch floor to light the bulb while it rolls thereover to a ball return by way of a chute back to the vicinity of the tee area. Tee areas are in front of the compartment targets, and



a sand trap chipping area is in between the nearest tee area and the compartment targets.

3,594,007
GOLFING DEVICE
Karl H. Kalberer, 2348 Westview Way, Santa Rosa, Calif.
Filed Apr. 11, 1969, Ser. No. 815,413
Int. Cl. A63b *69/36*
U.S. Cl. 273—183 B **3 Claims**

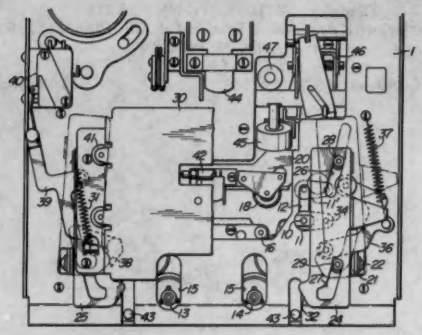


A device for detecting unwanted movement of a golfer's head has a base which fixes to a golfer's cap, and a pivotal arm extending from the base. The arm and base are interconnected by an adjustable spring, the tension of which holds the arm in a cocked position. However, when the golfer's head is moved in an undesirable manner, the arm, through its own inertia, overcomes the spring tension holding it cocked, and the arm snaps over against the base.

3,594,008
MAGNETIC TAPE RECORDING AND REPRODUCING DEVICE
Isamu Takagi, Tokyo, and Atushi Shino, Kunitachi-shi, both of, Japan, assignors to Aiwa Co., Ltd., Tokyo, Japan
Filed Sept. 23, 1969, Ser. No. 761,576
Claims priority, application Japan, Sept. 3, 1968, 43-55131
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 **3 Claims**

A magnetic tape recording and reproducing device which is adapted to any of three types of tape cartridges that are currently standard, wherein a large tape cartridge as well as a

small tape cartridge is inserted through a single entrance, the mechanisms for the small cartridge being automatically



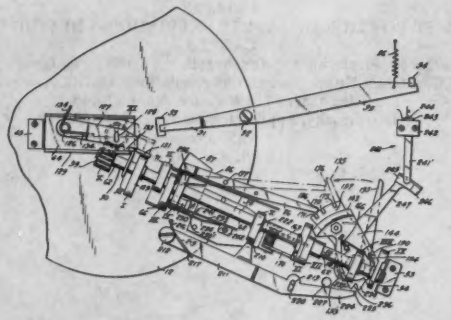
removed from the path of an incoming large cartridge when the large cartridge is inserted.

3,594,009

AUTOMATIC RECORD REPRODUCER APPARATUS

Pedro Sans Cerudo, Barcelona, Spain, assignor to V-M Corporation, Benton Harbor, Mich.

Filed Aug. 25, 1967, Ser. No. 663,251
Claims priority, application Spain, Sept. 8, 1966, 330996
Int. Cl. G11b *17/16*
U.S. Cl. 274—10 **45 Claims**



The invention relates to automatic record changers adapted particularly for reproducing records of different diameters. The records may be held in intermingled stacked relationship upon a supporting spindle element prior to release for play. A series of cams carried and supported for rotation upon a single camshaft functioning with suitable controls determines the operational sequence control. Rotation of the camshaft and its cams over a preestablished angle (usually 360°) controls the operation. Camshaft rotation is interrupted each time the shaft turns through the selected angle and is then reinitiated either manually or automatically. All normal operations are established in known sequence.

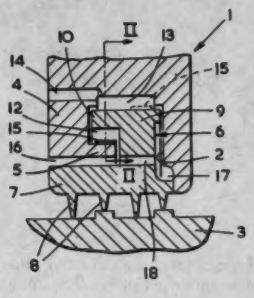
3,594,010

SHAFT SEAL FOR TURBINES

Laurence Hugo Frederick Warth, Rugby, England, assignor to The English Electric Company Limited, London, England

Filed July 22, 1969, Ser. No. 843,447
Claims priority, application Great Britain, July 19, 1968, 34535/68
Int. Cl. F02f *11/00*; F16j *15/48*
U.S. Cl. 277—53 **2 Claims**

A spring-loaded shaft seal for a steam turbine has a spring 15 which normally urges segments 7 lof the seal away from the rotor shaft 3. Thus a relatively large clearance is provided when the turbine is running up to speed and is on very light loads. An annular space 13 is provided around the segments 7 which is in communication with the higher pressure side of the seal via an opening 14. Thus the clearance between the seal and the rotor shaft 3 is substantially reduced when the



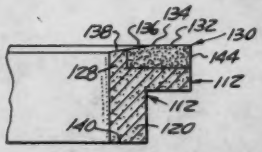
turbine is loaded up due to a significant increase in the pressure difference across the seal. For testing, the springs 15 are set as shown dotted in FIG. 2 to urge their segments 7 towards the rotor shaft 3 so that the normal on-load running clearance may be measured and any high spots on the segment glands may be removed. The springs 15 are reset to their normal position after testing is completed.

3,594,011

COMPOSITE WEAR-RESISTANT ARTICLES SUCH AS FACE SEALS

John Haller, Northville, Mich., assignor to Federal-Mogul Corporation, Southfied, Mich.

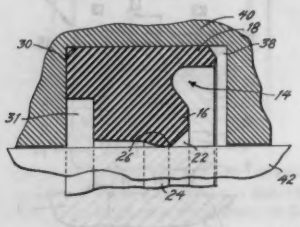
Filed Aug. 4, 1968, Ser. No. 847,183
Int. Cl. F16j *15/34*
U.S. Cl. 277—96 **5 Claims**



A shallow groove in the flange of an annular radially-flanged briquette of powdered base metal, such as powdered iron, is filled with powder of a wear-resistant metal alloy of high retentive hardness, and this assembly heated to a sufficiently high temperature to simultaneously sinter the base metal briquette and melt the superalloy type powder, which thereupon bonds itself with the iron. The periphery of this composite body is then ground away to expose the superalloy type metal alloy and then finish-machined on its annular face to grind away the edges of the groove and reduce them to the level of the surrounding base metal, a slight inward taper being preferably imparted to the inner part of the hard metal portion.

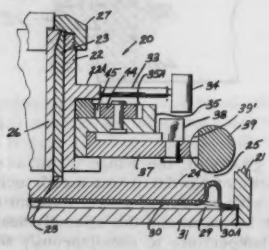
In a modification, a separate annular briquette of metal alloy powder of wear-resistant high-retentive hardness is prepared in a size adapted to mate with the groove of the base metal briquette and inserted therein. Thereupon the base metal briquette and the hard metal insert are simultaneously heated to sinter the iron powder briquette and melt the hard metal alloy so that it bonds itself to the sintered powdered iron base metal. The resulting annular blank is then machined by grinding as in the principal form of the invention.

3,594,012
SEALING DEVICE
Robert L. Whittaker, Gwynedd Manor; Joseph Donofry, Broomall, and Thorval L. Berg, Warminster, all of, Pa., assignors to Greene Tweed & Co., Inc., North Wales, Pa.
Filed June 17, 1969, Ser. No. 833,988
Int. Cl. F16j 15/32
U.S. Cl. 277—208 2 Claims



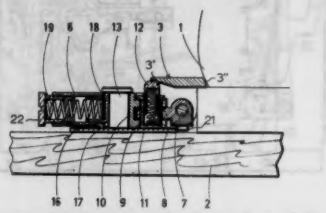
A sealing device includes an annular body having an inner periphery and an outer periphery. The annular body includes upstanding legs which define a generally U-shaped groove therebetween. One of the legs includes surfaces converging to an edge. The surfaces define an included angle of approximately 100—120°. The edge is on the inner periphery of the annular body and lies along a substantially solid width of the annular body in a radial direction. The nadir of the U-shaped groove is maintained above or no more than 10 percent of the overall height of the sealing device below said edge. The substantially solid width in a radial direction provides more sealing pressure at the edge and significantly minimizes leakage of fluid past the sealing device. The material of the annular body may be any suitable resilient gasketing material which has a compression modulus of 200 p.s.i. or about at 10 percent compression.

3,594,013
FLUID-ACTUATED CHUCKING AND INDEXING HEAD
Johannes Lauffer, Roter Berg, Germany, assignor to Hudson Automatic Machine & Tool Co., Union City, N.J.
Filed July 15, 1968, Ser. No. 745,031
Int. Cl. B23b 31/30
U.S. Cl. 279—4 22 Claims



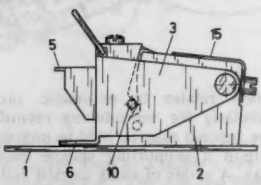
This disclosure is directed to a fluid-actuated chucking and indexing head comprising a housing in which there is disposed a rotatable spindle adapted to reciprocally receive a collet sleeve. A fluid-actuated pressure plate is arranged to exert a force on the collet sleeve to effect displacement thereof to clamp and unclamp a collet onto a workpiece. Operatively connected to the spindle is an indexing assembly to effect the indexing of the clamped workpiece predetermined angular mounts. Actuation of both the chucking features and indexing features of workpiece is attained by a fluid pressure. A valve means is provided for directing a fluid pressure on a pressure plate to control the opening and closing of the collet and/or for ejection of the workpiece from the collet and the cleaning of the head of any dirt, cutting or other particles resulting from a machining operation on the workpiece, and a second valve means is provided for controlling the fluid pressure directed to the indexing means.

3,594,014
SAFETY SKI BINDING
Georges P. J. Salomon, 34, avenue de Loverchy, Anecy, France
Filed Feb. 28, 1969, Ser. No. 803,271
Claims priority, application France, Feb. 28, 1968, Feb. 19, 1969, 1030-74; 6904385
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 15 Claims



Ski binding with a heel or toe clamp which is upwardly swingable against a spring force and is normally restrained against lateral motion by a fixed or spring-loaded abutment or abutments from which the clamp escapes upon an upward swing so as to become freely pivotable about a horizontal axis or transversely shiftable by generally parallelogrammatic motion.

3,594,015
HEEL PORTION OF SAFETY SKI BINDINGS DEVOID OF CABLES
Norbert Pfretschner, Innsburck, Austria, assignor to Geratebau Huber Kommanditgesellschaft, Gotzis, Austria
Filed Mar. 17, 1969, Ser. No. 807,665
Claims priority, application Austria, Mar. 15, 1968, A2573/68
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 8 Claims



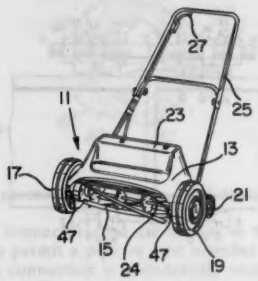
A heel portion of a ski binding comprises a casing which pivotably supports a latch lever for movement about a horizontal axis and a release lever for pivotal movement about a second horizontal axis. The release lever carries a heel retainer and a latching bolt which engages with a latching surface on the latch lever. A release spring is pivotably carried on the casing and acts on the latch lever to oppose release of the bolt from the latching surface, and the spring carries a displaceable element at its front end which is engaged with the latch lever for transmitting the force of the spring to the latch lever. The displaceable element is displaceable along the latch lever upon pivotal movement of the spring between a first position remote from the pivot axis of the latch lever on the casing and a second position closer to the latter axis, such that in the second position the opposite of the spring to release of the bolt from the latching surface is substantially less than in the first position.

3,594,016

WHEEL HEIGHT ADJUSTMENT FOR LAWNMOWER

Kenneth R. Wells, Joppa, and Timothy G. Pugh, Baltimore, both of, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 3, 1969, Ser. No. 854,867
Int. Cl. B62d 21/18
U.S. Cl. 280—43.17 10 Claims



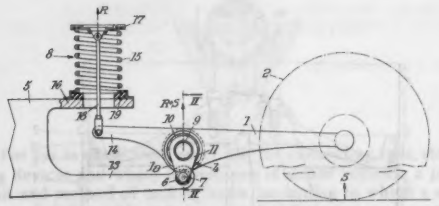
A powered lawnmower including a housing supported for movement by ground-engaging wheels. A powered cutting reel is supported upon the housing and cooperates with a stationary bed knife on the housing to cut grass as the mower travels along the ground. Novel means is provided to effect vertical adjustment of at least some of the wheels relative to the housing whereby to adjust the height to which the grass is cut.

3,594,017

VEHICLE SUSPENSION

Albert Grosseau, Chavelle, France, assignor to Citroen S. A. (Automobiles Citroen, Berliet, Panhard), Paris, France

Filed Mar. 18, 1969, Ser. No. 808,082
Claims priority, application France, Mar. 28, 1968, 145,997
Int. Cl. B60g 9/00
U.S. Cl. 280—124 11 Claims



On each side of the vehicle, a longitudinal arm carrying a wheel is mounted on a first transverse axle and a pendulous member rigidly carrying this axle is articulated to the chassis by the means of a second axle situated substantially in the vertical plane of the first axle; elastic means are interposed between the chassis and the arm. The two first axes (right side and left side) are rigidly interconnected by a rigid element.

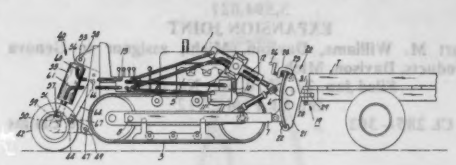
3,594,018

TRANSPORT APPARATUS FOR HEAVY MACHINERY SUCH AS BULLDOZERS OR THE LIKE

Edward A. Graetz, Rte 2 Box 69, Pound, Wis.

Filed Aug. 7, 1969, Ser. No. 848,169
Int. Cl. B60d 7/00
U.S. Cl. 280—415 R 3 Claims

Transport attachments for quick connection to a piece of heavy machinery for elevating the machinery off the ground for transport. A rear, hydraulically actuated attachment is easily coupled to the rear end of the piece of machinery and the hydraulic system of the machinery itself can be used to actuate the rear attachment and thereby elevate the rear end of the machinery. The front end of the machinery is elevated by clamping its vertically positionable member, such as a



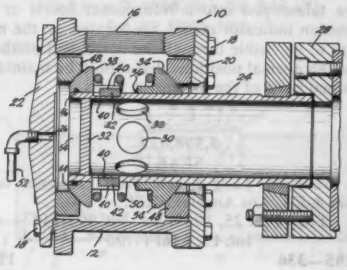
scraper blade, to a hitch clamp on a tractive vehicle, and the vertically positionable member is then lowered by the hydraulic system on the machinery, thereby raising the front end of the machinery clear of the ground for transport.

3,594,019

ROTARY JOINT

Ralph W. Gotschall, and Lawrence J. McDonough, both of Three Rivers, Mich., assignors to The Johnson Corporation, Three Rivers, Mich.

Filed July 22, 1969, Ser. No. 843,652
Int. Cl. F16l 55/00
U.S. Cl. 285—14 1 Claim



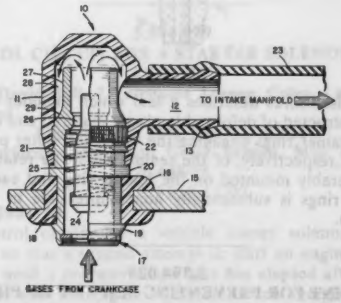
A rotary joint having a nipple with a closed end and a vented head.

3,594,020

FASTENING MEANS FOR CRANKCASE VENT VALVE

William E. Ehlert, Bellwood, Ill., assignor to Stanadyne, Inc., Bellwood, Ill.

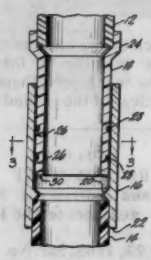
Filed Apr. 24, 1969, Ser. No. 818,861
Int. Cl. F16l 33/00
U.S. Cl. 285—239 5 Claims



An improved means and method for fastening a crankcase ventilating valve in an internal combustion engine comprising an outlet body of heat stabilized plastic receiving therein the metal valve housing of a crankcase vent valve with said housing having both a straight knurled portion and a locking ridge

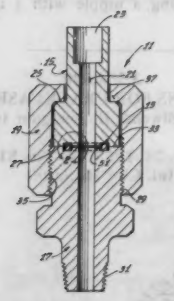
to provide adequate locking of the valve housing in the outlet body.

3,594,021
EXPANSION JOINT
Robert M. Williams, Davison, Mich., assignor to Genova Products, Davison, Mich.
Filed Jan. 27, 1970, Ser. No. 6,261
Int. Cl. F16l 27/12
U.S. Cl. 285—302 10 Claims



An expansion joint for thermoplastic piping for drain, waste and vent uses. The joint includes a movable piston or first sleeve telescoped into a transparent barrel or second sleeve. Position indicator means are located on the movable piston so as to be visible through the barrel and on the barrel to indicate the normal positions that should be maintained by the telescoped parts of the expansion joint.

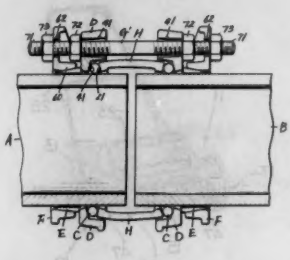
3,594,022
SEAL
Leslie A. Woodson, Long Beach, Calif., assignor to W. S. Shamban & Co., Los Angeles, Calif.
Filed Feb. 25, 1969, Ser. No. 802,144
Int. Cl. F16l 17/00
U.S. Cl. 285—336 11 Claims



This disclosures describes a seal which includes a sealing ring constructed of deformable plastic material and inner and outer retainer rings engaging the inner and outer peripheral surfaces, respectively, of the sealing ring. The retainer rings are preferably mounted on the sealing ring and each of the retainer rings is substantially noncompressible in the axial direction.

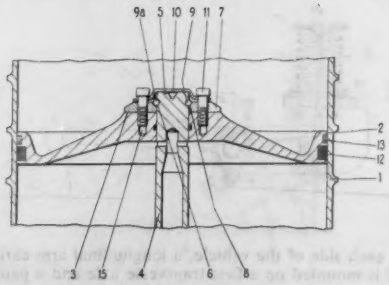
3,594,023
JOINT FOR PREVENTING SLIP-OFF OF PIPES
Shinkichi Yano, 137-1, Sakurazuka Dori, 7-chome, Toyonaka-shi, Osaka-Fu, Japan
Filed May 13, 1969, Ser. No. 824,165
Int. Cl. F16l 17/00
U.S. Cl. 285—337 3 Claims

A joint of such a construction that fitted on an annular rubber packing fitted on a connection is a ring for urging said packing against a connection step portion, said ring being pulled toward the connection step portion by clamp bolts and nuts to compress the packing between said ring and connection step portion, thereby pressing said packing against the connection step portion and against a pipe surface to prevent leakage of water through the connection and prevent the slip-off of a pipe by the frictional force of the packing, said joint being additionally provided with a split ring for grasping



the pipe and a holding ring for giving a wedging action to said split ring, said holding ring being pulled by the utilization of the clamp bolts and nuts toward the ring for urging the packing against the connection step portion, the wedging action exerted by the split and holding rings being effective to reduce the diameter of the split ring and cause the split ring to be grasped around the pipe surface. Other advantages and details of the arrangement will be made clear.

3,594,024
PISTON AND ROD ASSEMBLY
Siegfried Hertell, Kelsterbach, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Oct. 17, 1969, Ser. No. 867,177
Claims priority, application Germany, Oct. 19, 1968, P 18 04 037.4
Int. Cl. F16d 1/06
U.S. Cl. 287—53 R 7 Claims



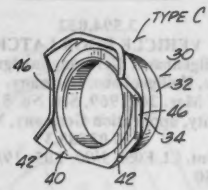
A rigid piston and rod connection in a hydraulic accumulator wherein a piston rod extending through an axial bore in the piston has a retainer ring fitted in an annular groove in the piston rod. A cover plate over the end of the piston rod clamps the retainer ring between one side of the annular groove and a bearing plate on the front face of the piston to provide the rigid connection and hold the piston rod perpendicular to the piston.

3,594,025
PIPE RAILING FITTING
Adolph A. Wagner, 3454 N. Shepard Ave., Milwaukee, Wis.
Filed Nov. 12, 1968, Ser. No. 774,961
Int. Cl. F16b 7/00
U.S. Cl. 287—54 5 Claims

A pipe railing fitting comprising an extruded collar portion and a connector cup portion. The extruded collar, common

to all fittings, is dimensioned to fit tightly in the end of a standard sized pipe or post. The connection is permanently secured by welding the collar to the pipe or post.

the connector cups vary in configuration to permit one or more pipe railings to be welded to the posts. Essentially four types of connector cups are required in order to accomplish



the various permutations arising in a typical pipe railing structure.

All of the connector cups are similar in that they are "precoped" to permit a pipe or post member to fit snugly in the cup. The connection is permanently secured by welding the members together.

3,594,026

BALL JOINT, ESPECIALLY FOR STEERING DEVICES AND WHEEL SUSPENSIONS OF MOTOR VEHICLES

Leopold F. Schmid, Pischekstrasse 49, 7000 Stuttgart-O, Germany

Filed Jan. 6, 1970, Ser. No. 888

Claims priority, application Germany, Jan. 8, 1969, Mar. 31, 1969, Apr. 2, 1969, Apr. 2, 1969, P 19 00 642.9; P 19 16 451.3; P 19 16 832.2; P 19 16 833.3

Int. Cl. F16c *11/06*

U.S. Cl. 287—87 **7 Claims**

For use in a ball joint, especially for connecting rods, steering devices and wheel suspensions of motor vehicles, a joint unit and method of making same, according to which a section of deformable tubular material has one end portion formed into a hollow ball head while by means of a constriction it is separated from a hollow shank portion forming an extension of said head and constriction and together with said head forming a single integral piece with different cross-sectional diameters, the thickness of cross-sectional areas of said ball head and said extension including said constriction increasing proportionally with the decrease in the outer diameter of said cross-sectional areas and vice versa.

3,594,027

STRESS-FREE CRIMP JOINT FOR PLASTIC-TO-METAL INTERFACES

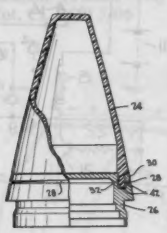
Murray Ressler, and George K. Lucey, Jr., both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 23, 1970, Ser. No. 21,734

Int. Cl. F16c *11/00*

U.S. Cl. 287—91 **4 Claims**

A stress-free crimp joint for plastic-to-metal interfaces for prevention against stress cracking of the plastic member. The plastic member has a dovetail flange that is placed in a channel in the metal member. The lip of the metal member that surrounds the flange is circumscribed with a groove. When the lip is crimped over the plastic flange, the groove ensures that the lip bends along an optimum, line, defined by the groove, and that none of the plastic is pinched after the



crimping action. The angle and magnitude of the crimp are carefully controlled so that after the crimping tool is removed the elastic springback of the lip is just sufficient to relieve any load on the plastic.

3,594,028

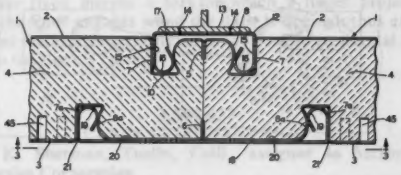
SHEET METAL JOINT FOR PANELS AND SHEETS

Victor P. Scott, Canton, Ohio, assignor to Macomber, Incorporated, Canton, Ohio

Filed Aug. 7, 1969, Ser. No. 848,181

Int. Cl. F16b *5/06*

U.S. Cl. 287—189.36 **9 Claims**



A sheet metal joint for wall and ceiling panels, roofing and sidewall sheets, etc. The joint may be between wall or ceiling panels and an attaching strip, or between adjoining roofing or sidewall sheets.

One member has an open tubular flange at one side edge and there is a channel at the adjacent edge portion of the other member, the channel having a restricted throat into which the open tubular flange is snapped and locked.

The wall and ceiling panels are formed of spaced metal sheets with a heat and cold insulation such as polyurethane therebetween.

3,594,029

CONTROL CIRCUIT FOR A STARTER SOLENOID ON A VEHICLE

William David Holt, 7 Thirlmere Avenue, Colen, Lancashire, England

Filed Apr. 14, 1970, Ser. No. 28,316

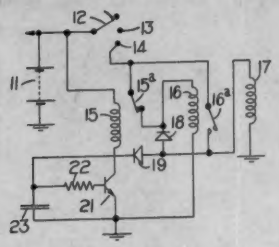
Claims priority, application Great Britain, May 27, 1969, 26,638/69

Int. Cl. F02h *11/00*

U.S. Cl. 290—38 **1 Claim**

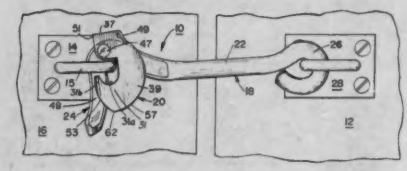
A control circuit for a vehicle starter solenoid which operates so that a second attempt to start an engine cannot be made until a predetermined time has elapsed after a first attempt to start the engine. A starter switch energizes a first rely which completes a circuit to the starter solenoid, completes a self-hold circuit to itself and charges a capacitor connected across the base emitter path of a transistor. The transistor then energizes a second relay which opens a contact between the starter switch and the first relay to break the circuit to the first relay other than through the self-hold

circuit. The first relay is then deenergized when the starter switch is opened so that the capacitor discharges through the



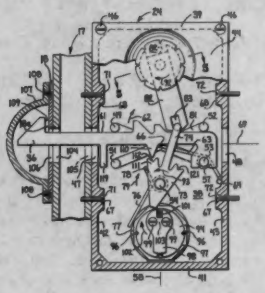
base-emitter path of the transistor to keep the second relay energized for a predetermined period of time during which the second relay prevents the first relay from being reenergized.

3,594,030
SAFETY GATE HOOK
Richard K. Paetz, Sterling, Ill., assignor to National Manufacturing Co., Sterling, Ill.
Filed Nov. 6, 1968, Ser. No. 773,747
Int. Cl. E05c *19/12*
U.S. Cl. 292—108 **3 Claims**



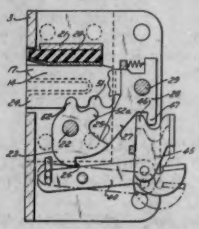
A safety gate hook includes a hook having a hook-shaped front end for hooking onto a wire staple of a staple plate and having a safety-latching dog pivotally mounted on the front end of the hook. The latching dog extends under the staple when the hook is hooked thereon to prevent a spurious upwardly directed force from unhooking the hook from the staple.

3,594,031
UNIVERSAL PARTITION-LOCKING SYSTEM
Jerold R. Ford, 12302 Windsor Drive, Carmel, Ind.
Filed Nov. 30, 1967, Ser. No. 686,858
Int. Cl. E05b *15/10, 65/06, 65/08;* **E05c** *1/06*
U.S. Cl. 292—140 **12 Claims**



A partition wall with a door, and a lock-receiving opening in the door. A mortise lock receivable in the opening, and having guide and pivot posts and apertures therein arranged for utilization in sliding or swinging doors, left-hand or right-hand opening, inswinging or outswinging, by choice of one or the other of two latches of special design, one pivotable and the other slidable. Accessory units and partition door edge and jamb features facilitating substitution of a padlock for the mortise lock in a slidable or swinging doors.

3,594,032
VEHICLE DOOR LATCH
Max Lampe, Heiligenhaus, Germany, assignor to Firma Arn. Kiekert Sohore, Heiligenhaus, Germany
Filed Mar. 26, 1969, Ser. No. 810,555
Claims priority, application Germany, Mar. 29, 1968, P 17 03 083.3
Int. Cl. E05b *3/00;* **E05c** *19/00*
U.S. Cl. 292—280 **12 Claims**

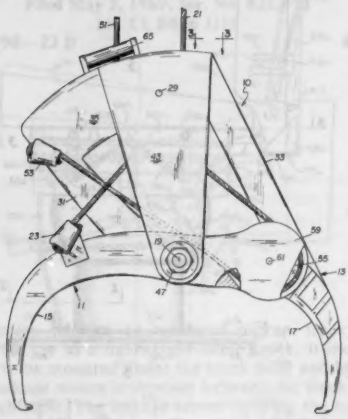


A vehicle door latch has a bolt on the doorpost and a lock on the door in which the bolt is received. A door handle is linked nonpositively to the lock by a hook such that the handle can only actuate the lock when it is pulled away from the door. The bolt is advantageously wedged between a ratchet cam and a body of stiff but resiliently compressible material when fully engaged in the lock to prevent mutual displacement between the door and the doorpost.

3,594,033
FIRECRACKER HOLDER-THROWER DEVICE
Willie Ray McLemore, Rte. 2, Box 178, Benton, La.
Filed Dec. 30, 1968, Ser. No. 788,357
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 R **1 Claim**

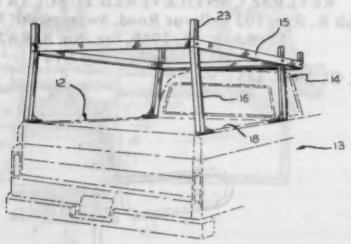
A device for the safe shooting and throwing of firecrackers consisting of a firecracker holder mounted on one end of a rod of suitable length, with a handle on the opposite end thereof.

3,594,034
GRAPPLE-LOGGING APPARATUS
Henry C. Rowell, P.O. Box 366, Myrtle Point, Oreg.
Filed Mar. 13, 1969, Ser. No. 806,959
Int. Cl. B66c 3/12, 3/14
U.S. Cl. 294—111 5 Claims



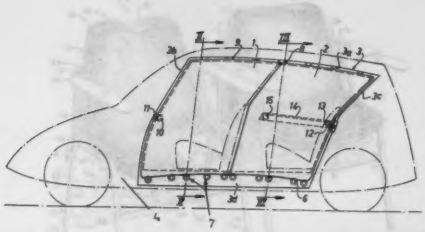
A carriage is pulled along a haulback cable in a retrieving direction by a mainline cable which also turns a triple pulley on the carriage to pull a grapple closing cable to hold closed a grapple member 11 through a force multiplying pulley and support the carriage. The triple pulley is actuated by a strawline cable to release the grapple member through a non-multiplying, release cable. The triple pulley has differential portions for taking up and paying out the grapple closing cable and the release cable.

3,594,035
PICKUP TRUCK RACK
Clifford W. Ferguson, Morris, Ill., assignor to Cerco Corporation, Joliet, Ill.
Filed Feb. 10, 1969, Ser. No. 798,025
Int. Cl. B62d 33/00
U.S. Cl. 296—3 4 Claims



Rack for a pickup truck to facilitate transporting of long pieces of equipment such as ladders, boards and the like including upstanding members mountable on the truck box having longitudinally extending side rails extending over the box and the cab of the truck, and cross bars extending between the side rails with stakes on opposite ends between which long pieces of equipment may be arranged.

3,594,036
VEHICLES WITH SLIDING DOORS
Jean G. Cadiou, Paris, France, assignor to Societe Anonyme Andre Citroen, Paris, France
Filed May 26, 1969, Ser. No. 827,800
Claims priority, application France, May 30, 1968, 3,510
Int. Cl. B60j 5/06
U.S. Cl. 296—155 3 Claims



A vehicle with a sliding door or doors in which a hollow, quadrilateral frame in which said door is slidable is manufactured separately from the remainder of the vehicle, being fixed to the vehicle body after completion of the latter and preferably after the equipping of the frame with all necessary runners, latch members and the like fittings for the door and possible after the insertion of the door or doors into the frame.

According to another feature of the invention the opening movement of a sliding door lifts an armrest from a normal to a raised position, the armrest pivotting on a pillar fixed to the floor of the vehicle. Preferably the armrest forms with a member fixed thereto a fork in which a finger projecting from the door engages when the door is opened, thus ensuring that the armrest returns from its raised to its normal position as the door is closed.

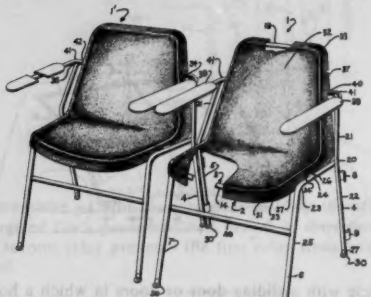
3,594,037
CABIN ATTENDANT SEAT
Gale K. Sherman, Tustin, Calif., assignor to McDonnell Douglas Corporation
Filed Apr. 9, 1970, Ser. No. 27,032
Int. Cl. A47c 9/06
U.S. Cl. 297—14 9 Claims

A compact thin profile cabin attendant seat folding automatically when occupant arises. An extensible headrest, tilting backrest and forwardly moving seat bottom frame are interlinked for simultaneous movement.

3,594,038
CHAIR AND GANGING CONNECTORS
Norman Polsky; Edgar M. Lieberman; Robert W. Quearry, and David Maslan, all of Kansas City, Mo., assignors to Fixtures Manufacturing Corporation, Kansas City, Mo.
Filed Nov. 29, 1968, Ser. No. 779,954
Int. Cl. A47c 1/124
U.S. Cl. 297—248 5 Claims

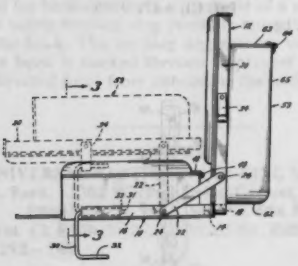
Ganging connectors are mounted on chair legs and include an upper clip and a lower clip each having means therein for

receiving and retaining a corresponding leg on an adjacent similar chair. The legs having the ganging connectors mounted thereon are inclined relative to the supporting surface. The chair has a unitary seat and back structure received



in a loop frame having a substantially horizontal seat supporting portion and a substantially vertical back supporting portion and spaced legs connected to opposite sides of the frame back portion and spaced legs connected to opposite sides of the frame seat portion.

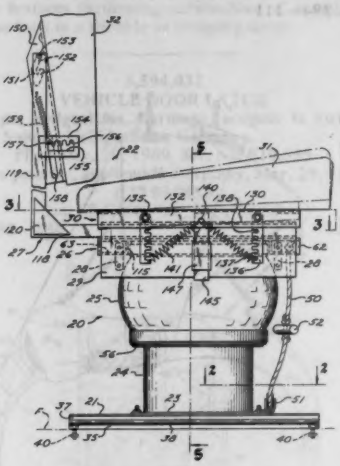
3,594,039
STADIUM CHAIR
Charles E. Harp, 2110 Harper St., Pasadena, Tex.
Filed Apr. 2, 1969, Ser. No. 812,679
Int. Cl. A47c 1/16
U.S. Cl. 297—252 **5 Claims**

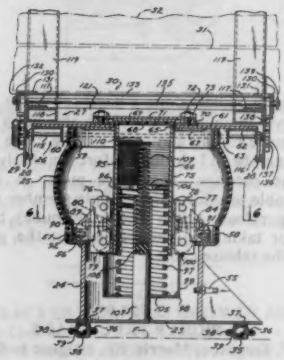


A stadium chair of folding construction having compartments enclosed within both the seat and back portions for readily accessible storage of blankets, food and drink containers, and other accessories.

3,594,040
SUSPENSION DEVICE
Edwin P. Monroe, 255 Barrett Road, Berea, Ohio
Filed Dec. 31, 1968, Ser. No. 788,228
Int. Cl. A47c 3/02
U.S. Cl. 297—307 **33 Claims**

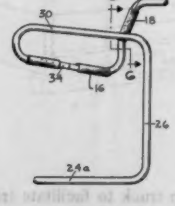
An air chamber including a resilient boot is provided between the base and seat portion of a vehicle seat. A post projects downwardly from the seat portion inside the boot and is guided for vertical movement by rollers mounted on means fixed with respect to the base. Spring means resist excessive upward and downward movement of the seat, and means are provided to allow limited fore-and-aft movement of the seat to offset backslap. The seat includes seat and





backrest cushions and means for raising, lowering, and tilting either cushion.

3,594,041
REVERSE CANTILEVERED TUBULAR CHAIR
Ralph K. Rye, 102 Bellevue Road, Swampscott, Mass.
Filed Aug. 11, 1969, Ser. No. 848,824
Int. Cl. A47c 7/00, 7/14
U.S. Cl. 297—445 **8 Claims**



A two-part, tubular chair having a cantilevered seat that is supported at the rear of the chair. The chair base frame is formed from two tubular members, one positioned within the other, which are bent together to provide sufficient structural strength to prevent deflection of the reverse cantilevered seat

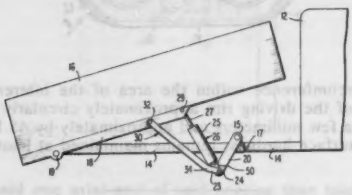
section A tubular back frame having a back rest member is removably secured to the base frame to complete the chair structure.

3,594,042

SWINGING CYLINDER TRUCK HOIST

Donald E. Gauch, Grundy Center, Iowa, assignor to Mid Equipment Corporation, Grundy Center, Iowa

Filed May 5, 1969, Ser. No. 821,921
Int. Cl. B60p 1/16
U.S. Cl. 298—22 D 4 Claims



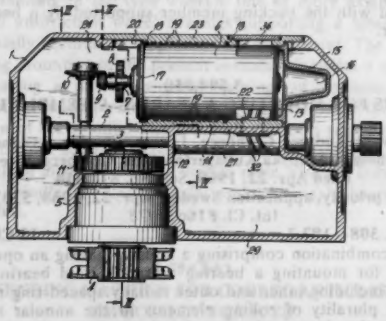
This device permits an ordinary pickup truck to be modified for use as a lightweight dump truck. It includes a subframe to be mounted under the truck body and hydraulic cylinder linkage means interposed between the truck chassis and the subframe. The linkage serves to swing the hydraulic cylinder rearwardly and upwardly as it is expanded so a short hydraulic cylinder can be used rather than the conventional long cylinders. Further, when the cylinder is collapsed there is no concern over inadequate truck chassis clearance since the short cylinder rides far off the ground.

3,594,043

WINCH FOR UNDERGROUND MINING

Karl-Heinz Weber, Witten-Heven, and Horst Odenkirchen, Bochum, both of, Germany, assignors to Gebr. Eickhoff, Maschinenfabrik and Eisengiesserei mbH, Bochum, Germany

Filed Dec. 30, 1969, Ser. No. 889,186
Claims priority, application Germany, Jan. 2, 1969, P 19 00 025.0
Int. Cl. E21c 29/10
U.S. Cl. 299—42 14 Claims



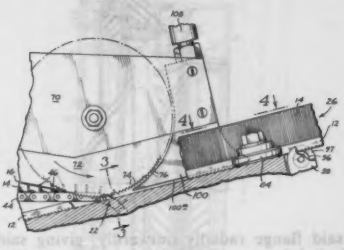
A driving unit for installation in a coal-cutting machine in which a housing has arranged therein a cooling block with a substantially cylindrical bore in which an electric motor is detachably arranged and through a stepdown transmission likewise arranged in said housing is drivingly connected to a sprocket wheel or winch for operative engagement with a chain or cable for advancing the driving unit.

3,594,044

APPARATUS FOR MANUFACTURING STRIP BRUSHES

Benjamin Koback, Portland, Oreg., assignor to Ben-Ko-Matic Inc., Portland, Oreg.

Filed Sept. 4, 1969, Ser. No. 855,250
Int. Cl. A46d 9/00
U.S. Cl. 300—2 8 Claims



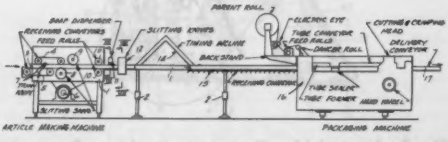
Apparatus for manufacturing strip brushes which is operable to move an elongated open-topped channel strip, a series of elongated bristles, and an elongated binding element together at a press station. The outer edge of a press wheel presses the midregions of the bristles and the binding element into the channel strip at the press station. Rows of teeth extending around the periphery of the press wheel engage the bristles adjacent opposite sides of the channel strip to maintain proper bristle alignment as they are pressed into the channel strip. A pair of opposed clamp members spaced downstream from the press wheel clamp the sides of the channel strip toward each other to lock the bristles and binding element therein. A retainer shoe extends between the press member and the clamp members to hold the midregions of the bristles in the channel strip until they are locked therein.

3,594,045

APPARATUS FOR AND METHOD OF MAKING SLITTED ARTICLES

Karl A. Pannier, Jr., and Gordon S. Reynolds, both of Salt Lake City, Utah, assignors to Le Voy's, Inc., Salt Lake City, Utah

Filed Mar. 12, 1970, Ser. No. 18,837
Int. Cl. A46d 9/06
U.S. Cl. 300—21 17 Claims



Apparatus for and a method of making slitted articles, for example, an article in the general shape of a rectangular block, the apparatus providing slits extending only partially through the article and running both longitudinally and transversely of the article, there being slits in a plurality of faces of the article, if desired. The entire article is formed including the slits and passed through a packaging machine in substantially continuous motion at high speed.

3,594,046

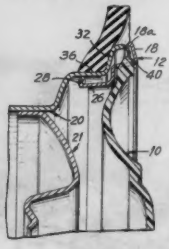
WHEEL COVER

Claude J. Marshall, Ann Arbor, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

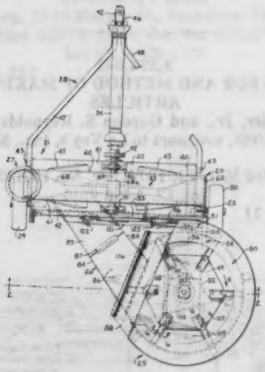
Filed Mar. 18, 1969, Ser. No. 808,208
Int. Cl. B60b 7/02
U.S. Cl. 301—37 P 8 Claims

A two-piece automotive wheel cover including a central circular decorative member and a metal ring surrounding the periphery of the decorative member with radially outwardly

projecting tapered locking bosses spaced around and extending from the periphery of said decorative member engaged in openings in a normally generally cylindrical flange of said mounting ring to lock the assembly together, the configuration of said bosses being such as to locally and elastically displace said flange radially outwardly, giving said flange an overall slightly noncylindrical shape, the resilience of said flange holding said mounting ring in firm, rattle-free engagement with said decorative member even when the wheel cover shrinks within anticipated limits.



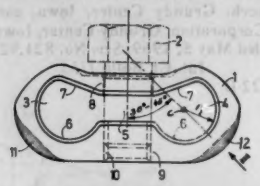
3,594,047
FEED-MATERIAL-HANDLING APPARATUS
Richard A. Pucher, and James Gordon Greiner, both of Leala, Pa., assignors to Sperry Rand Corporation, New Holland, Pa., by said Pucher
Filed Jan. 12, 1970, Ser. No. 2,229
Int. Cl. B65g *53/40*
U.S. Cl. 302—37 **19 Claims**



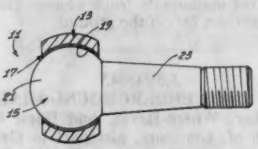
The feed-material-handling apparatus has a frame vertically supporting a feed material blower with an upwardly extending transition discharge member and horizontally supporting an impeller with a rotor for delivering feed material to the blower. The blower discharges the material upwardly through the transition member. In the two forms of the horizontal impeller the rotor turns clockwise in one and counterclockwise in the other. The frame is mounted on detachable wheels.

3,594,048
TRACK LINK CONNECTOR
Otto Korner, and Rolf Muller, both of Remscheid, Germany, assignors to Diehl, Nurnberg, Germany
Filed May 26, 1969, Ser. No. 827,544
Claims priority, application Germany, June 1, 1968, P 17 55 630.8
Int. Cl. B62d *55/28*
U.S. Cl. 305—58 **1 Claim**

A track chain connecting link, especially clamping connector, which comprises a slot interconnecting the two chain bolt bearing eyes and extending along the plane passing through the two central axes of the bearing eyes while extending over the entire width of the connecting link which slot is compressible by means of a clamping screw, the track link connector consisting of steel being induction hardened at the circumference within the area of the interengaging portions of the driving rim approximately circularly over a depth of a few millimeters and approximately by 45 HRc so that the surface hardness remains maintained at least by 50 HRc.



3,594,049
BEARING LINER
Peter H. Turner, Granada Hills, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.
Filed June 19, 1969, Ser. No. 834,851
Int. Cl. F16c *9/06*
U.S. Cl. 308—72 **24 Claims**

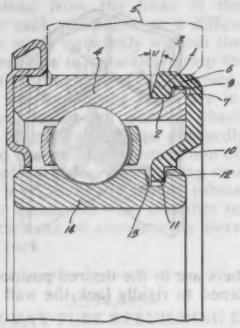


A bearing liner which includes a backing member and a mixture of an adhesive and powdered low-friction material. The backing member has a roughened, irregular or porous surface. The adhesive and low-friction material are disposed in a thin layer only a few mils thick so that the particles of the low-friction material are mechanically supported in a fixed position within the pores of the backing member. This fixed positioning of the particles is facilitated by the chemical bonding provided by the adhesive. The bearing liner is disposed with the backing member supported by a bearing member.

3,594,050
MEANS FOR MOUNTING A BEARING ASSEMBLY IN A HOUSING
Karl Evald Andreas Gothberg, Lerum, Sweden, assignor to Aktiebolaget Svenska Kullagerfabriken, Goteberg, Sweden
Filed Apr. 22, 1969, Ser. No. 818,314
Claims priority, application Sweden, Apr. 22, 1968, 5337/68
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.2 **12 Claims**

The combination comprising a housing having an opening therein for mounting a bearing assembly, said bearing assembly including inner and outer radially spaced ring members, a plurality of rolling elements in the annular space between the ring members, and at least one cover member made of an elastic material at one axial end of the bearing adapted to seat the outer ring in said housing opening against relative rotation with respect to the housing, said cover member having an annular portion seating in a groove in the outer surface of the outer ring, a substantially cylindrical thinner portion connecting the annular portion to a planar sidewall of the cover, said annular portion being of a size and configuration to exert a radial pressure against the bearing housing and outer ring member, said annular portion having a first supporting surface engaging he the bearing housing

and being axially displaced in relation to a second supporting surface engaging in the outer ring groove and being located



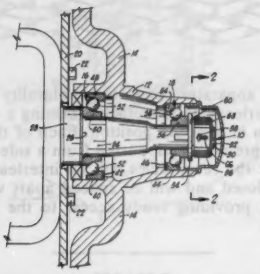
nearer said one axial end of said bearing than said second supporting surface.

3,594,051

WHEEL BEARING MOUNTING

Leonard A. Wells, Oklahoma City, Okla., assignor to June M. Hicks, Oklahoma City, Okla.

Filed July 23, 1969, Ser. No. 844,107
Int. Cl. F16c *13/02*
U.S. Cl. 308—191 3 Claims



The present invention relates to an improved wheel bearing mounting of the type wherein one or more axially preloaded antifriction wheel bearings supporting a wheel hub are axially secured on a spindle by a spindle nut. The wheel bearing mounting of the present invention includes a spindle nut having a pair of aligned openings in opposite sides thereof for mating with a cotterway disposed in the threaded portion of the spindle. The spindle nut is of a size such that when the nut is threaded on the spindle to the position where the pair of aligned openings therein mate with the cotterway in the spindle, the desired axial preload on said bearings is provided.

3,594,052

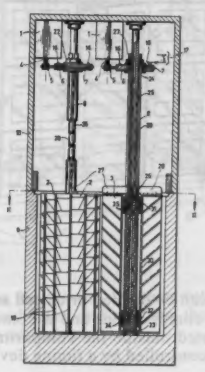
VENDING MACHINE FOR COOLED ARTICLES ESPECIALLY FOR ICES

Alexander H. L. Spronken, Beek, Netherlands, assignor to Spronken N.V., Beek, Netherlands

Filed Jan. 2, 1969, Ser. No. 788,529
Claims priority, application Netherlands, Jan. 4, 1968, 6800139
Int. Cl. A47f *1/00*
U.S. Cl. 312—36 5 Claims

A cooling circuit within the housing of an automatic vending machine for cream ices covers only the lower part of the housing onto a level just above the upper side of a helically rotatable magazine in its lowest position. The helically arranged compartments of the latter are in a manner known per se under control of a coin-actuated mechanism and successively brought to register with a delivery opening provided in the casing just below the said upper cooling space level.

By opening the upper space of the housing above the said



level the empty magazine is made accessible at least at its front and at both sides.

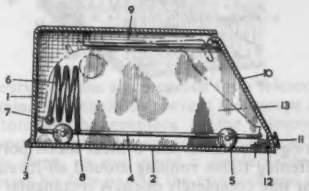
The compartments are downwardly inclined onto the center of the magazine and in any position of the latter the cooled space is separated by empty magazine parts from the noncooled space within the housing.

3,594,053

TYPEWRITER CASE

Johan Joseph Winkens, 32, Kerkstraat, Bocholtz, Netherlands

Filed Jan. 16, 1969, Ser. No. 791,736
Claims priority, application Netherlands, Jan. 22, 1968, 6800923
Int. Cl. A47b *21/00*
U.S. Cl. 312—208 2 Claims



A typewriter case, adapted to be disposed on or fixed to a desk, has a front wall adapted to be slid under its top wall, and has the typewriter mounted for sliding out from, and return to, the case through the so opened front of the case. The typewriter is carried by a carriage secured to the case by extensible means and the carriage is provided with rollers which may be retracted for stabilizing the support of the typewriter when extended.

3,594,054

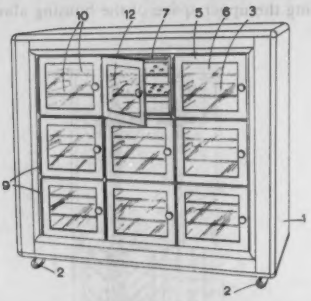
APPARATUS FOR USE IN THE DETERMINATION OF THE RELATIVE HUMIDITY OF SUBSTANCES

David N. Gore, Westhumble, near Dorking, Surrey, and Harold G. Wilkinson, Worthing, Sussex, both of, England, assignors to Beecham Group Limited

Filed July 24, 1968, Ser. No. 747,388
Int. Cl. A47b *77/08*; A47f *5/08*
U.S. Cl. 312—209 3 Claims

The invention relates to an apparatus for use in the determination of weight changes in substances exposed to at-

mospheres of different relative humidities. The apparatus comprises a cabinet containing a plurality of moistureproof compartments for samples to be tested. Each compartment

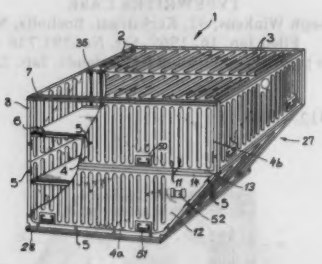


has a door which can be opened or closed as desired. A fan is provided in each compartment and a common drive means for the fan is located outside the compartments. The operation of the fans is controlled by a timing device.

3,594,055
SHEET METAL AIRFREIGHT CONTAINER

Alfred Lohr, Herborn; Helmut Hemmann, Herborn, and Herman Eichtner, Munich, all of, Germany, assignors to Burger Eisenwerke Aktiengesellschaft, Herborn Dillkreis, Germany

Filed June 11, 1969, Ser. No. 832,089
Int. Cl. E05b *00/00*
U.S. Cl. 312—215 **10 Claims**



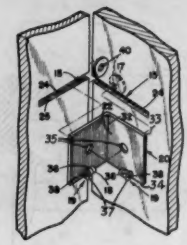
An airfreight container has a sheet metal polyhedral shell with a stiffening frame running around all its edges and one rectangular side completely open. A rectangular door fits the open side and has its own frame which is just received within the opening of that side while a hinge along the upper edge of the door and the open side allows the door to swing outwardly. Spaced around all of the edges of the door, except the hinged edge, are individually operable latches which are engageable with the receptacle frame to hold the door tightly in place. In addition, the door can fold in the middle and is provided with latches at inner locations that are engageable with shelves in the shell.

3,594,056
FURNITURE ASSEMBLY AND CONNECTOR THEREFOR

Gerald S. Sager, Frankfort, Ill., assignor to Sager Industries Incorporated, Frankfort, Ill.

Filed Jan. 13, 1969, Ser. No. 790,582
Int. Cl. A47b *47/00*
U.S. Cl. 312—263 **4 Claims**

A connector is formed with a rigid bracket having clamping means including bearing members for insertion into substantially T-shaped grooves in knocked down wall member of a furniture assembly such as a vanity, cabinet or the like. The bearing members are dimensioned to permit adjusting movement of the wall members in directions parallel or normal to the longitudinal dimension of the respective grooves. When

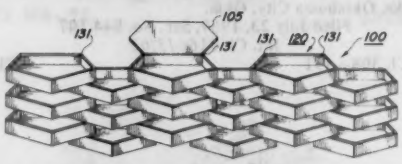


the wall members are in the desired positions, the clamping means is tightened to rigidly lock the wall members in this position.

3,594,057
CONTAINER APPARATUS

Dennis George Moore, 1312 Kathy Court, Livermore, Calif.

Filed Nov. 4, 1968, Ser. No. 773,267
Int. Cl. A47b *88/02*
U.S. Cl. 312—283 **22 Claims**

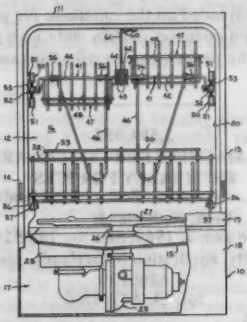


A container apparatus comprising a plurality of operatively connected interleavable receptacles forming a closed unitary structure when in a closed position. Each of the plurality of receptacles is preferably supported from a sidewall in a position such that the receptacles will be interleaved when the container is closed and will be spaced apart when the container is open providing ready access to the contents contained therein.

3,594,058
RACK ASSEMBLY FOR FRONT-LOADING DISHWASHER

Melvin R. Kauffman, Louisville, Ky., assignor to General Electric Company

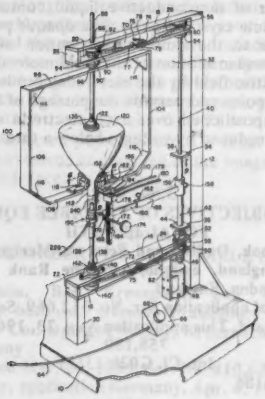
Filed Apr. 17, 1969, Ser. No. 817,033
Int. Cl. E04b ; A47b *88/00, 95/00*
U.S. Cl. 312—298 **10 Claims**



In a front-loading dishwashing machine of the type having a front access opening to a washing chamber, and dish-sup-

porting racks that may be manually slid outwardly from the chamber and through the access opening to facilitate loading of the machine with soiled tableware, a means is provided whereby when one dish-supporting rack is manually pulled outwardly to extend from the front of the dishwashing machine, another rack positioned at a different horizontal level is caused to move outwardly without the need for the operator of the machine to separately grasp the second rack and pull it outward through the access opening. It is also provided, when the dish-supporting racks are in their normal operating position, within the washing chamber, that the second rack may be manually moved outwardly independent the first rack, if so desired. The construction of the invention is particularly applicable to a dishwashing machine wherein upper and lower level racks are spaced substantially distant from one another within the wash chamber so that large or cumbersome articles can be conveniently stored for washing in the lower level rack.

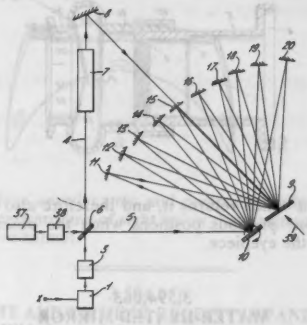
3,594,059
CATHODE-RAY TUBE REBUILDING DEVICE
Henry F. Holz, 7234 N. Claremont, Chicago, Ill.
Filed June 30, 1969, Ser. No. 837,770
Int. Cl. H01j *9/50*
U.S. Cl. 316—28 **12 Claims**



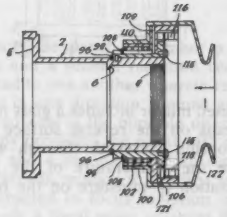
A device for holding and rotating a cathode-ray tube upon a true axis during the rebuilding of the tube including self-aligning mandrel members driven by slack-free chains carrying a reinforced tube saddle, with automatic compensation for tube misalignment, and radial two-directional microadjustment tool-mounting means for renecking the tube and installation of a new electron gun.

3,594,060
HIGH-SPEED HOLOGRAPHIC CAMERA
Michael Anthony Lowe, Basingstoke, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Sept. 2, 1969, Ser. No. 854,411
Claims priority, application Great Britain, Sept. 6, 1968, 42650/68
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **9 Claims**

This invention provides apparatus for producing successive three-dimensional images of high-speed events, e.g. stages of an explosion. A pulsed beam of laser light is divided into a reference and an object beam. The reference beam is reflected by a high-speed rotating mirror to a succession of fixed mirrors from which it is reflected on to a fixed photograph plate. The object beam, after reflection from or transmission through the high-speed event, is also reflected on to the plate. The pulsed laser beam is synchronized with the position of the rotating mirror by means of a continuous light beam which is reflected from the rotating mirror to a photodetector associated with each of the fixed mirrors, the laser being triggered by outputs from the successive photodetectors. The result is a number of multiplexed holograms of the event on the plate. Three-dimensional images of its successive stages can be viewed by substituting a continuous laser for the pulsed laser and viewing the developed plate while rotating the mirror slowly.



3,594,061
SIGHTING TELESCOPES WITH DISPLACEABLE EYEGUARDS
John James Selvage, Romford, England, assignor to The Rank Organization Limited, London, England
Filed Apr. 10, 1969, Ser. No. 815,153
Claims priority, application Great Britain, Apr. 11, 1968, 17625/68
Int. Cl. G02b *23/16*
U.S. Cl. 350—57 **1 Claim**

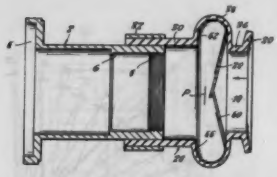


Light-obscuring means are provided for a telescope having internal illumination means to prevent the escape of such illumination through the eyepiece of the telescope except when an observer applies his eye to the eyepiece. In each of the examples given, an eye guard is displaceable when the observer presses his face against the eyepiece and this causes the movement of an obscuring device in the eyepiece away from a setting in which the light path through the eyepiece is closed. The eye guard and the obscuring device are subject to the action of a biassing member so that they return to their previous positions when the observer moves away from the eyepiece.

3,594,062
SIGHTING TELESCOPE WITH FLEXIBLE EYEGUARD
David Robert Disley, Harlow, England, assignor to The Rank Organization Limited, London, England
Filed Apr. 10, 1969, Ser. No. 815,152
Claims priority, application Great Britain, Apr. 11, 1968, 17625/68
Int. Cl. G02b *23/16*
U.S. Cl. 350—17 **5 Claims**

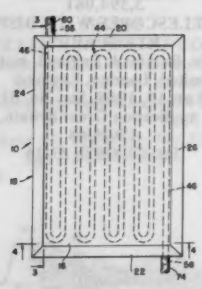
Light-obscuring means are provided for a telescope having internal illumination means to prevent the escape of such illumination through the eyepiece of the telescope except when an observer applies his eye to the eyepiece. In each of the examples given, an eye guard is displaceable when the observer presses his face against the eyepiece and this causes

the movement of shutter flaps that are attached to the eye guard away from a setting in which the light path through the eyepiece is closed. The eye guard is of a flexible material the



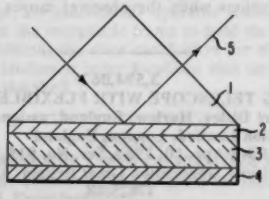
resilience of which returns it, and therefore also the shutter flaps to their previous positions when the observer moves away from the eyepiece.

3,594,063
WATER-HEATED MIRROR
Charles M. Smillie, III, 4220 Iverness, Orchard Lake, Mich.
Filed Apr. 1, 1969, Ser. No. 812,155
Int. Cl. G02b
U.S. Cl. 350—61 **1 Claim**



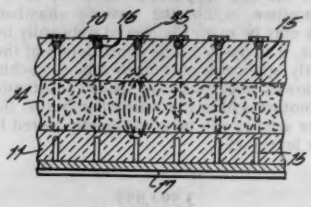
The water-heated mirror includes a glass mirror panel having conduit means on the reverse surface thereof in heat exchange relationship therewith through which hot water flows to elevate the temperature of the glass panel and prevent condensation of moisture on the reflecting surface thereof.

3,594,064
ENHANCED MAGNETO-OPTIC MIRROR APPARATUS
John David Bierlein, Wilmington, Del., and E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed June 25, 1969, Ser. No. 836,275
Int. Cl. G02f *1/18*
U.S. Cl. 350—151 **4 Claims**



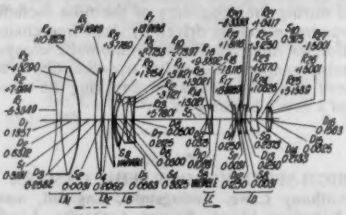
A transparent medium (usually a prism) having a magnetic mirror of a thin magnetic layer, a conversion matching dielectric layer, and finally a reflecting layer provides enhanced longitudinal Kerr effect conversivity with low ellipticity for reflected radiation. The magnetic mirror converts magnetic signals to signals of electromagnetic radiation and can be used for the optical readout of magnetic tapes.

3,594,065
MULTIPLE IRIS RASTER
Alvin M. Marks, 153-16 10th Ave., Whitestone, N.Y.
Continuation-in-part of application Ser. No. 567,456, July 25, 1966, now Patent No. 3,451,742. This application May 26, 1969, Ser. No. 834,929
Int. Cl. G02f *1/34*
U.S. Cl. 350—160 **12 Claims**



A variable light-transmitting panel is described having plural spaced electrostatic control electrodes. The control electrodes can be selectively energized to show a picture or other desired graphic information by modulating transmitted light or by controlling selected areas to alter the reflection coefficient of light. The control electrodes are mounted adjacent to a thin layer of nonconductive liquid containing a large number of minute crystal dipoles. The opaque portions of the raster are due to the random distribution of the dipoles caused by Brownian motion of the fluid molecules. Application of an electric field by the electrodes produces an alignment of the dipoles and permits the passage of light. A small mask may be positioned over each electrode area to block out any light produced by voltages below a threshold voltage.

3,594,066
OPTICAL OBJECTIVES OF VARIABLE EQUIVALENT FOCAL LENGTH
Gordon H. Cook, Oadby, and Peter A. Merigold, Thurnby, both of, England, assignors to The Rank Organization Limited, London, England
Continuation of application Ser. No. 312,669, Sept. 30, 1963, now abandoned. This application Aug. 23, 1968, Ser. No. 758,180
Int. Cl. G02b *15/18*
U.S. Cl. 350—186 **32 Claims**



An optical objective of the zoom type having a front member which for a given object position remains stationary during the zooming relative movements, an assembly located behind the front member and incorporating the members of the objective movable for zooming purposes, and a stationary rear member, wherein the front member is divided into front and rear portions and focusing to suit different object positions is effected by axial movement only of the rear portion of the front member, the stationary front portion of the front member being approximately afocal (that is having an equivalent focal length numerically greater than 4 f_A, where f_A is the equivalent focal length of the complete front member for an infinitely distant object) and including a divergent element and a convergent element, whilst the rear portion of the front member is convergent and has an equivalent focal length between 0.75 f_A and 1.25 f_A.

3,594,067

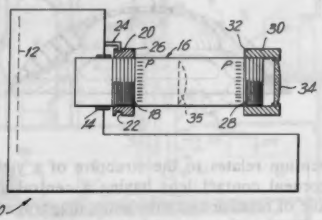
VARIABLE FOCAL LENGTH OBJECTIVE FOR ROTARY CAMERAS

Paolo Garbati, Via Sonnino 37, Cagliari, Italy

Continuation-in-part of application Ser. No. 543,145, Apr. 18, 1966, now abandoned. This application June 18, 1969, Ser. No. 834,315

Int. Cl. G02b *15/18*

U.S. Cl. 350—186 13 Claims



A lens for a rotary or panoramic camera. The lens includes a pair of optical systems at least one of which is movable along their common optical axis with respect to the other, so as to provide a lens of variable focal length. The entire lens is also adjustable along the optical axis for focusing purposes. A manually operable adjusting structure is provided for adjusting the lens, and this adjusting structure includes graduations indicating different object distances. The adjusting structure provides for each object distance a given focal length, so that the focal lengths and object distances have a predetermined relationship with respect to each other. This relationship provides for any selected object distance a focal length which will prevent movement or creeping of the image with respect to the film which receives the image.

3,594,068

SHOCK ABSORBER FOR ADJUSTABLE OPTICAL COMPONENTS

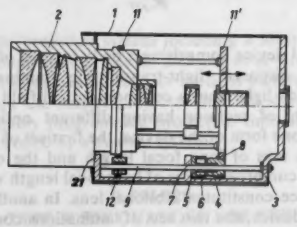
Lothar Kirstein, Bad Kreuznach, and Gerd Kunz, Biebelsheim, both of, Germany, assignors to Fa. Jos. Schneider & Co., Optische Werke, Kreuznach, Bad Kreuznach, Germany

Filed Mar. 26, 1969, Ser. No. 810,639

Claims priority, application Germany, Apr. 4, 1968, P 17 72 142.5

Int. Cl. G02b *7/04*

U.S. Cl. 350—255 1 Claim



A hydraulic or pneumatic bumper is interposed between a slidable lens assembly and a support therefor to cushion the impact in a terminal position of the displacement stroke.

3,594,069

INTEGRAL REAR VIEW MIRROR FACE SHIELD

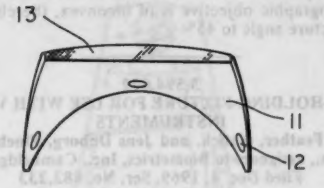
Warren L. Harvey, P. O. Box 622 W. Main St., Mendham, N.J.

Filed Feb. 18, 1969, Ser. No. 800,095

Int. Cl. G02b *7/18*

U.S. Cl. 350—298 1 Claim

A one piece rear view mirror face shield as used with a protective helmet. The mirrored surface is positioned below the eye level of the user and is substantially the same width as the face shield permitting a practical focal length within a relatively clean aerodynamic and compact configuration by utilizing a rearward line of sight below the maximum width of the protective helmet.



3,594,070

LIGHT AND/OR HEAT RECEPTIVE PANELS

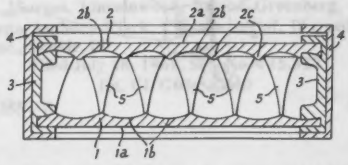
William A. Whitehead, 5 Osterley Park Road, Southall, England

Filed Nov. 22, 1968, Ser. No. 778,216

Claims priority, application Great Britain, Nov. 30, 1967, 54605/67

Int. Cl. G02b *17/00*

U.S. Cl. 350—260 14 Claims



A radiation receptive panel which has a first radiation receptive surface and a second radiation receptive surface which are so related to one another wherein radiation passing through the panel in one direction is much greater than the radiation which can pass in the opposite direction. This may be accomplished by providing the panel with a first radiation receptive surface and a second radiation receptive surface which is small in area in relation to the first surface, and the panel being constructed to focus radiation incident on the first surface towards a focal point adjacent the second surface.

3,594,071

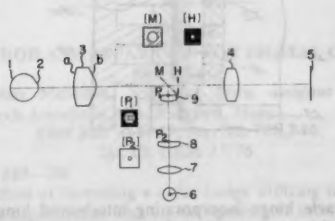
OPHTHALMOSCOPIC CAMERA

Hirokazu Okajima, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 7, 1969, Ser. No. 864,327

Int. Cl. A61b *3/14*; G03b *19/02*; A61b *3/10*

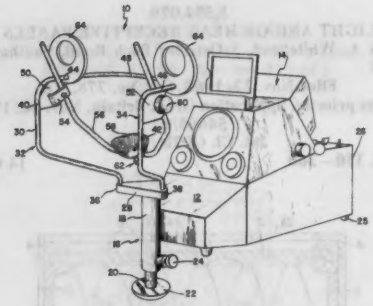
U.S. Cl. 351—7 2 Claims



An ophthalmoscopic camera is provided which can eliminate undesired light reflected from the cornea of an eye to be examined and the front and back surfaces of a front objective through which the illumination light passes by interposing a ring-shaped aperture between a plane reflecting mir-

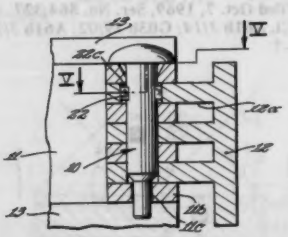
ror and a condenser lens arranged next to the reflecting mirror and a small shield between said condenser lens and the next condenser lens so as to shield a small area in the vicinity of and including the optical axis. The optical system for photography includes no such shield as described above and said photographic objective is of biconvex, thereby increasing the picture angle to 45°

3,594,072
HEAD-HOLDING FIXTURE FOR USE WITH VISUAL INSTRUMENTS
James E. Feather, Natick, and Jens Duborg, Pinehurst, both of, Mass., assignors to Biometrics, Inc., Cambridge, Mass.
Filed Dec. 4, 1969, Ser. No. 882,233
Int. Cl. A61b *3/00*
U.S. Cl. 351—38 **5 Claims**



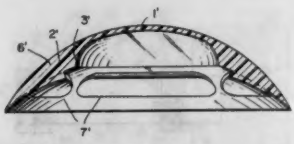
A head-holding fixture for use with visual instruments including a frame with a laterally extending bar for engaging the forehead and a moveable chin support for pivoting the head about the laterally extending bar and/or changing the head elevation with respect to it so as to provide both height and tilt adjustment.

3,594,073
SPECTACLE HINGE
John N. Liautaud, Glenview, Ill., assignor to Fendall Company, Chicago, Ill.
Filed July 9, 1969, Ser. No. 840,426
Int. Cl. G02c *5/22*
U.S. Cl. 351—141 **6 Claims**



A spectacle hinge incorporating interleaved hinge members and a hinge pin passing pivotally therebetween wherein the hinge pin is provided with projecting means providing an interlocking relationship with one of the hinge members in normal positions of spectacle operation or storage in a manner preventing inadvertent hinge disassembly.

3,594,074
CONTACT LENS WITH FLEXIBLE CENTRAL PORTION
Hyman Rosen, Hewlett, N.Y., assignor to Alexander Mencher, Forest Hills, N.Y., a part interest
Continuation-in-part of application Ser. No. 564,268, July 11, 1966, now Patent No. 3,468,602. This application June 16, 1969, Ser. No. 833,611
Int. Cl. G02c *7/04*
U.S. Cl. 351—160 **2 Claims**



The invention relates to the structure of a yieldable and resilient corneal contact lens having a central and domed area capable of relative and substantial diaphragmatic action without contacting the eye and responsive to exertion and release of pressure induced by eyelid movement. Said lens has an outer peripheral area engageable with the eye and is provided with channels on the inner side to permit ingress and egress of eye or tear fluids to and from said domed area which latter serves as a fluid chamber. An intermediate thickened or reinforced peripheral area connected to the edge of the domed area serves as the support or fulcrum for the diaphragmatic action of the domed area and also serves to connect with the outer peripheral engageable area adapted to float on and adhere to the eye proximate to the cornea.

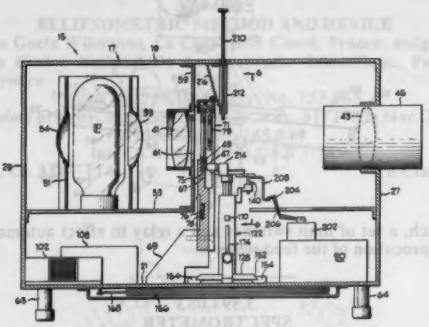
3,594,075
BIFOCAL OPHTHALMIC LENS
David Jean Smith, 3925 Tall Pines Drive, New Orleans, La.
Filed Oct. 14, 1968, Ser. No. 767,454
Int. Cl. G02c *7/06;* **G02b** *5/04*
U.S. Cl. 351—172 **3 Claims**

An optical device comprising a body formed of two sets of alternately disposed light-transmitting laminar sections through which light from a common optical field is directed, the two sets of sections having different optical characteristics. In one form of the device, the first set of laminations comprises a lens of long focal length and the other set of laminations comprises a lens of long focal length whereby the optical device constitutes a bifocal lens. In another form of the optical device, the two sets of laminations constitute sections of prisms having different optical characteristics so that the images of objects in the field of view of the device are transmitted in different directions.

3,594,076
AUDIO-SLIDE PROJECTOR
Gunars Licitis, Lombard; Norman Kramer, Chicago; Marvin I. Glass, Chicago, and Harry Disko, Parks Ridge, all of, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed June 10, 1968, Ser. No. 735,804
Int. Cl. G03b *31/06*
U.S. Cl. 353—19 **2 Claims**

A slide projector for projecting individually mounted transparencies and including means for recording and reproducing

a sound message on the transparency mounting. The transparency is mounted on a frame of cardboard or the like and a marginal portion of the mounting frame includes a strip of magnetic recording tape. The projector includes a recording



and playback unit having a pickup and recording head portion positioned for movement laterally and vertically with respect to the position of the magnetic tape when a mounted transparency is in position for projection.

3,594,077

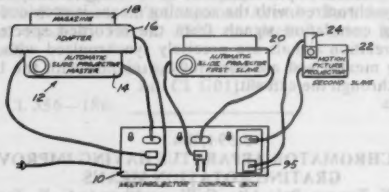
MULTIPLE PROJECTOR SYSTEM WITH SINGLE SOUND SOURCE

Raymond Marquis, Plainville, Conn., and Edward K. Kaprelian, Mendham, N.J., assignors to The Kalart Company Inc., Plainville, Conn.

Filed June 24, 1968, Ser. No. 739,293

Int. Cl. G03b *21/00*

U.S. Cl. 353—94 **13 Claims**



A multiple projector system including a master projector such as a sound slide projector and one or several slave projectors such as slide projectors or motions picture projectors, and in which the master projector and the slave projectors share adjustably programmed projection time and playback time as controlled by a control system.

3,594,078

STACK-TYPE SLIDE CHANGER FOR USE WITH A SLIDE DISPLAY DEVICE HAVING A GATE OPEN AT THE TOP THEREOF

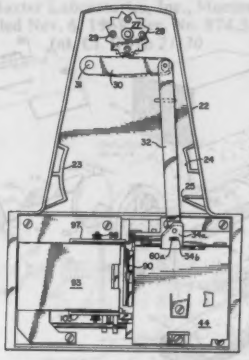
Walter J. Hall, Evanston, Ill., assignor to GAF Corporation, New York, N.Y.

Filed Mar. 12, 1969, Ser. No. 808,039

Int. Cl. G03b *23/02*

U.S. Cl. 353—111 **13 Claims**

A slide loader is mounted over a vertical projection gate open at the top thereof. The slide loader includes supply and takeup magazines for supporting slides in face-to-face contact. A pair of members engage edge portions of the foremost slide in the supply magazine for rocking such slide to separate the same from the adjacent slide and to orient such foremost slide with a discharge opening at the outlet end of the supply magazine. A shiftable plate receives the foremost slide after it passes through such discharge opening and holds the slide over the gate in readiness for dropping thereinto.



Upon movement of this plate to a release position, the foremost slide is allowed to drop into the projection gate.

3,594,079

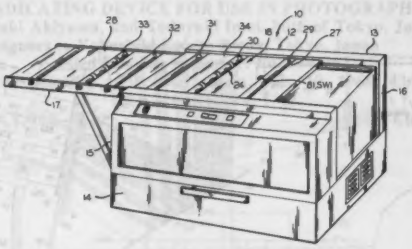
BOOK COPIER WITH MOVABLE CARRIER

Karl M. Murgas, Lincolnwood; Burton Greenberg, Chicago, and Otto Anthony Clark, Chicago, all of, Ill., assignors to ICP Inc., Skokie, Ill.

Filed July 18, 1968, Ser. No. 745,822

Int. Cl. G03g *15/00*

U.S. Cl. 355—8 **5 Claims**



A book copier machine having a carrier on which a book is positioned. A drive roller contacting the carrier moves the carrier in one direction from a first end toward a second end so that a page is reproduced as it moves past a scanning window, and reversing means reverses the direction of rotation of the drive roller when the carrier reaches the second end, to cause the carrier to move back toward said first end.

3,594,080

METHOD AND APPARATUS FOR DIGITAL COLOR PRINTING

Larry Max McMillin, Jefferson, Iowa, assignor to Allied Research Associates, Inc., Concord, Mass.

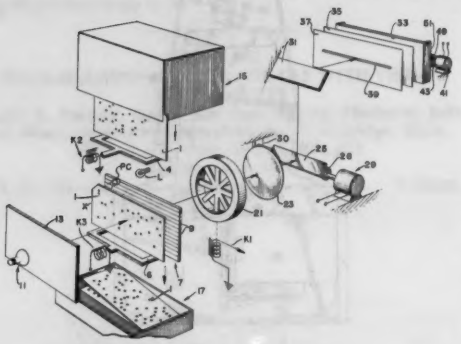
Filed Jan. 3, 1969, Ser. No. 788,846

Int. Cl. G03b *27/76*

U.S. Cl. 355—36 **6 Claims**

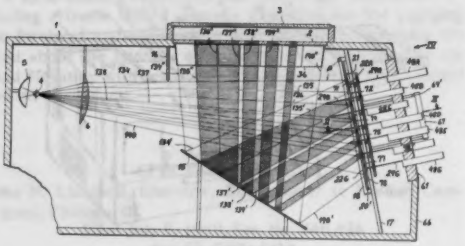
A method of recording a color image utilizing information signals in digital form. The digital signals give information for a line of the image to be recorded. Under the control of these information signals, different colors are sequentially recorded through a line mask upon color film, each sequence corresponding to a digital encoding of the distribution of the corresponding color along the line in the image being

recorded. The apparatus for practicing the method includes punchcard-scanning means for producing digital-coded



colored light signals and distributing the appropriate colored light upon a photographic emulsion.

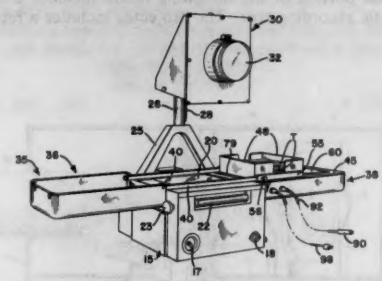
3,594,081
ADJUSTABLE ILLUMINATING DEVICE
Werner Tschink, Nassauische Str. 4, 1 Berlin, 31, Germany
Filed Nov. 4, 1968, Ser. No. 773,083
Int. Cl. G03b *27/70*
U.S. Cl. 355—67 **17 Claims**



An illuminating device, particularly for photographic copying and enlarging, includes a multiplicity of striplike, relatively inclined mirrors for the reflection of a light beam onto a translucent window. The mirrors divide the beam into a multiplicity of ray bundles which can be selectively intercepted, in whole or in part, by individual light shields interposable in their path; a plurality of such shields are disposed in closely adjoining or overlapping relationship between any pair of adjacent mirrors to intercept rays incident upon one mirror and rays reflected by the other mirror of the pair.

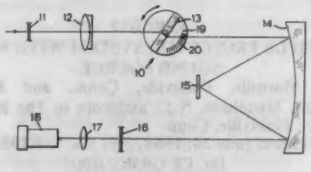
3,594,082
SLIDE CHANGER FOR AN OVERHEAD PROJECTOR
Thomas M. Lonchar, 237 Holmes Drive, Fairborn, Ohio
Filed July 31, 1969, Ser. No. 846,489
Int. Cl. G03b *23/02, 1/48*
U.S. Cl. 353—113 **8 Claims**

A slide changer attachment includes mating case sections pivotally connected by slidable adjustable arms which provide for selectively mounting the attachment on various overhead slide projectors of different widths. An intermediate panel is mounted one of the case sections and supports a sliding feed plate adjacent the bottom of a hopper. The feed plate is connected to an endless belt driven by a reversible motor controlled by a circuit including a manually actuated



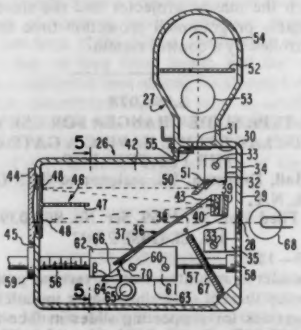
switch, a set of limit switches and a relay to effect automatic reciprocation of the feed plate.

3,594,083
SPECTROMETER
Anthony Rene Barringer, Willowdale, Ontario, Canada, assignor to Barringer Research Limited, Rexdale, Ontario, Canada
Filed July 7, 1969, Ser. No. 839,718
Int. Cl. G01j *3/42, 3/06*
U.S. Cl. 356—83 **9 Claims**



A scanning spectrometer having means for scanning entrance slit images across an exit slit. A predetermined spectrum is recorded photographically or magnetically, and means synchronized with the scanning means is provided for obtaining correlation signals from the recorded spectrum. The correlation signals are precisely synchronized with the scanning means, and are used for correlation with the light passing through the exit slit.

3,594,084
MONOCHROMATOR APPARATUS HAVING IMPROVED GRATING ROTATION MEANS
George K. Turner, Palo Alto, Calif., assignor to G. K. Turner Associates, Palo Alto, Calif.
Filed Aug. 1, 1969, Ser. No. 846,796
Int. Cl. G01j *3/06, 3/18*
U.S. Cl. 356—100 **2 Claims**



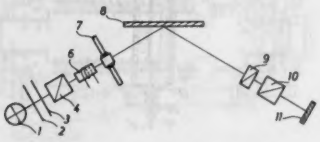
A diffraction-grating-type monochromator apparatus having an improved apparatus for rotating the grating is described. The grating is fixedly mounted at the pivot of a follower arm which is pivoted by an arm bearing portion engaging the sloped surface of a wedge-shaped bearing member

driven in a direction at an acute angle to the plane of the sloped surface. The wedge-shaped member is a solid wedge or a member in which the acute angle between the sloped surface and the direction of the drive is adjustable.

3,594,085
ELLIPSOMETRIC METHOD AND DEVICE

Ingo Goetz Wilmanns, La Celle Saint Cloud, France, assignor to Centre National De La Recherche Scientifique, Paris, France

Filed Aug. 28, 1968, Ser. No. 755,965
Claims priority, application France, Aug. 31, 1967, Mar. 22, 1968, 119,567;145,044
Int. Cl. G01b *11/26*; G02f *1/18*
U.S. Cl. 356—114 **6 Claims**

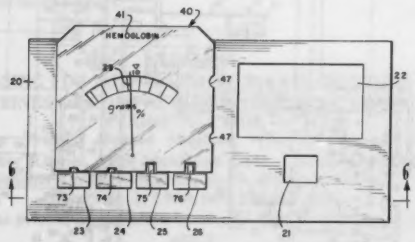


An ellipsometric device and method for applying a phase modulation and a polarization direction modulation to a beam of light at two different frequencies and using a polarized parallel monochromatic light beam, a polarization modulator, a phase modulator, and means to angularly displace with respect to each other, an assembly having on one hand a beam polarizer phase and azimuth modulator and on the other hand the sample, an equalizer, analyzer and photoreceiver.

3,594,086
COLORIMETER USING INTERCHANGEABLE METER FACE MEMBERS

Leonard A. Hughes, 1526 Mountain Blvd., Oakland, Calif.; Willard Tressel, 667 Cragmont Avenue, Berkeley, Calif., and Evan R. Flavell, 3200 Shattuck Avenue, Berkeley, Calif.

Filed Oct. 1, 1968, Ser. No. 764,190
Int. Cl. G01j *3/48*
U.S. Cl. 356—186 **4 Claims**

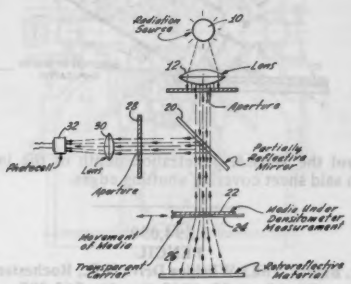


A colorimeter which, as one unit of instrumentation, quantitatively analyzes individual test samples of biologic materials for medical purposes according to any one of a presently substantial and prospectively expandable number of different qualitative assays. The instrumentation features a single unscaled meter with an indicator, a set of interchangeable dials that provide both scales for different assays to the meter and switch actuators for automatic selection of photocells for different assays, a constant temperature environment for the photocells, and light distribution by fiber optics. The meter and its indicator are calibrated to a midscale value representing a physiologically significant value of an assayed material. The unit also has a timer and constant temperature wells for preparation of test samples.

3,594,087
OPTICAL DENSITOMETER WITH RETROREFLECTIVE MEANS

Victor Eduardo Vasquez Miranda, Huntington Beach, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Nov. 6, 1969, Ser. No. 874,556
Int. Cl. G01n *21/30*
U.S. Cl. 356—203 **4 Claims**

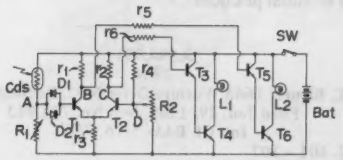


An improved optical densitometer is provided for measuring the varying optical densities of a photographic film, or equivalent media, along the length of the media, and which includes retroreflective means for compensating for irregularities in the surface of the media which would otherwise affect the precision of the optical density readings.

3,594,088
OPTIMUM OR UNDER OR OVER EXPOSURE-INDICATING DEVICE FOR USE IN PHOTOGRAPHY

Hideaki Akiyama, and Tadayuki Imai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Jan. 29, 1969, Ser. No. 794,962
Claims priority, application Japan, Feb. 10, 1968, 43/8296
Int. Cl. G01j *1/44*, *1/42*
U.S. Cl. 356—226 **2 Claims**



An optimum or under or over exposure-indicating device for use in photography in which a differential amplifier is actuated in response to the balance or unbalance of a bridge circuit having one arm thereof composed of a photoconductive member for photometry, whereby both or either of two lamps is lighted for indication of optimum or under or over exposure.

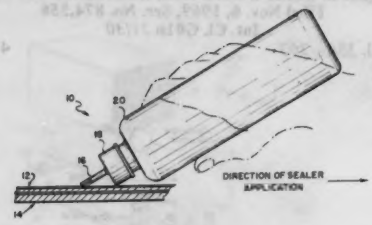
3,594,089
SEAM SEALER APPLICATOR

William H. Powell, Livingston, and Newton S. Foster, Rutherford, both of, N.J., assignors to Congoleum Industries, Inc., Kearny, N.J.

Filed July 16, 1969, Ser. No. 842,225
Int. Cl. B43m *11/06*
U.S. Cl. 401—9 **9 Claims**

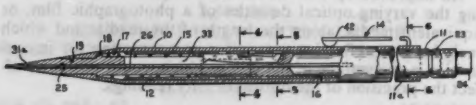
A shaped implement through the end of which fluid sealer is dispensed has an element for parting adjacent abutting

edges of sheet floor covering along a seam immediately ahead of the dispensed sealer fluid, there also being elements



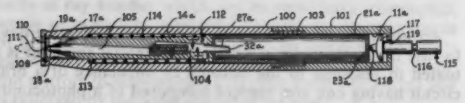
to control the vertical penetration depth of the implement between said sheet covering abutting edges.

3,594,090
PENCIL
Keith T. Bleuer, 1663 Wilshire Drive N.E., Rochester, Minn.
Filed Sept. 30, 1969, Ser. No. 862,297
Int. Cl. B43k *21/12*
U.S. Cl. 401—70 **11 Claims**



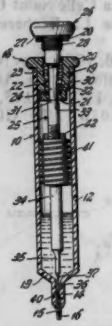
A lead pencil having a core element providing a longitudinal duct through which sticks of writing lead may travel, a slider member disposed on the core element and having a lever portion disposed in a longitudinal slot in the core element and pivoted at a place intermediate its ends, a rotatable sleeve having a helical slot in it for receiving a part of the lever portion for moving the lever portion, while engaging a lead stick, forwardly in the duct and being of reduced width on its forward end so as to force the lever portion out of the slot, and a spring for returning the slider member and lever portion to initial positions.

3,594,091
PEN
Keith T. Bleuer, 1663 Wilshire Drive N.E., Rochester, Minn.
Filed Jan. 29, 1969, Ser. No. 794,913
Int. Cl. B43k *5/16, 7/12*
U.S. Cl. 401—107 **5 Claims**



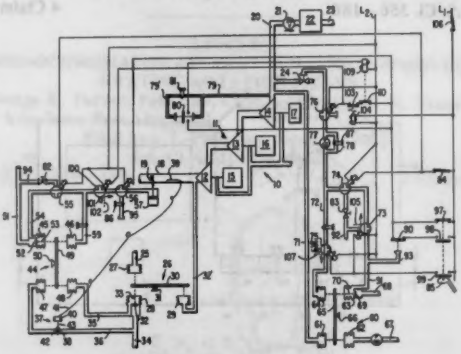
A ballpoint pen using liquid ink including a pen housing, an ink cartridge, and ball-carrying plunger assembly reciprocably movable in the housing so that the ball and assembly may be moved forwardly to protrude from the housing, a disc of rubberlike material having a central perforation therethrough and located internally and at the forward end of the housing through which the ball and assembly may be moved and forming an ink seal when the ball and assembly is in retracted position in the housing, and selectively operable means at the other end of the housing for selectively moving the cartridge and ball assembly forwardly in the housing and holding it in such a position.

3,594,092
DRAFTING PEN
Carlton M. DiCarlo, 3 Station Road, Madison, N.J.
Filed Mar. 6, 1969, Ser. No. 804,810
Int. Cl. B43k *1/10*
U.S. Cl. 401—258 **6 Claims**



A reservoir drafting pen comprising a barrel having an ink storage portion and a tubular pen point at one end communicating therewith and an inner member having a stem capable of reciprocation and having a needle adapted to clean the tubular pen point and having a control member providing a novel vent and ink leakage control means, including a helical thread, for the pen. The drafting pen is easy to construct and assemble, easy to fill and clean or change the color of ink, cannot bleed through the tubular tip, and provides a uniform flow of ink.

3,594,093
OPERATION OF GAS COMPRESSION APPARATUS
Nick Lukacs, Adamsburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.
Filed July 31, 1969, Ser. No. 846,567
Int. Cl. F01b *25/00;* **F04b** *49/00*
U.S. Cl. 415—15 **4 Claims**



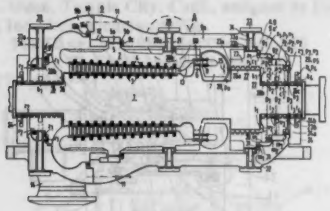
A control system for regulating operation of a gas compression apparatus, selectively operable on either base mode or on intermittent mode. The control system includes a solenoid valve having a first operating position and having a second operating position. The solenoid valve, when in its first operating position, is operable to transmit a predetermined control signal operable to position an inlet valve regulating flow of gas to the compressor at approximately 30 percent of its fully open position and in its second operating position, is operable to transmit a varying control signal, operable to modulate the inlet valve at any operating position, depending upon the temperature and pressure characteristics of the gas entering the compression plant.

3,594,094

SHAFT SEAL WITH AXIAL LABYRINTH FOR TURBOMACHINES

Wilhelm Engelke, and Axel Remberg, both of Mulheim-Ruhr, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 2, 1969, Ser. No. 881,442
Claims priority, application Germany, Dec. 3, 1968, P 18 12 492.0
Int. Cl. F01d *11/02*
U.S. Cl. 415—111 17 Claims



Shaft seal for turbomachines includes a cylindrical shell having a diameter greater than the shaft, labyrinth seals axially disposable in the clearance between the shell and the shaft, and mounting means for holding the shell coaxially to the shaft formed of annular surfaces at the shell periphery extending perpendicularly to the shell axis and being retainable against stream pressure from an interior space of the turbomachine by corresponding surfaces formed on a surrounding part of the turbomachine, the shell surfaces being axially spaced from one another and having annular intermediate chambers located between successive sealing rings in the axial direction, the intermediate chambers being subjectible to pressure intermediate the pressures in the interior and exterior of the turbomachine for attaining a decreasing pressure staging from interior to exterior of the turbomachine, the labyrinth chambers of the labyrinth seals axially spaced a distance from the turbomachine interior corresponding to the distance of the intermediate chambers therefrom being connected by a pressure-equalizing channel to the respective intermediate chambers.

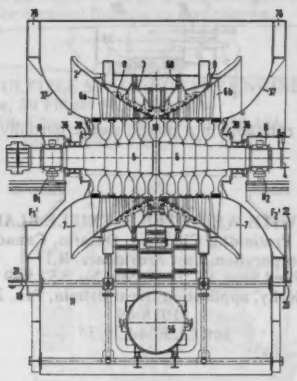
3,594,095

CASING FOR LOW-PRESSURE STAGES OF STEAM TURBINES OF COMPLETELY WELDED MULTISHELL CONSTRUCTION

Werner Trassel; Helmut Maghon; Wilhelm Engelke, and Walter Klamet, all of Muhlheim-Ruhr, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Dec. 2, 1969, Ser. No. 881,446
Claims priority, application Germany, Dec. 3, 1968, P 18 12 487.3
Int. Cl. F01d *1/24*
U.S. Cl. 415—60 16 Claims

Housing assembly for low-pressure parts of steam turbines includes housing for the individual turbine parts mounted on foundation support independently of one another, the underportions of a respective outer housing of a turbine part being connected in the vicinity of an axial partial joint of the outer housing and at both longitudinal sides thereof with longitudinal support frame forming integral housing components and being mounted by ends of the longitudinal support frames, projecting beyond the faces of the outer housing on the foundation support, the outer housing at one face thereof being axially fixedly and horizontally displaceably mounted on support locations of the longitudinal support frame and at the other face thereof being both axially and horizontally displaceably mounted on support locations of the longitudinal



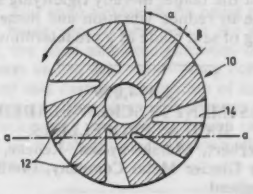
support frame, the outer housing being heat-expansibly movable in axial direction thereof.

3,594,096

COMBINED CARRYING AND DRIVING DEVICE FOR WATERCRAFTS

Eywin Scharffenberg-Kahlke, Karlsro, Lidingo, Sweden, assignor to Eywin, Scharffenberg-Kahlke Karlsro, Lidingo, Sweden

Filed Sept. 19, 1968, Ser. No. 760,837
Claims priority, application Sweden, Sept. 26, 1967, 13196/67
Int. Cl. B63h *5/02*
U.S. Cl. 416—84 1 Claim



A marine craft having frame means and rotary means rotatably supported on the frame means for propelling and providing the sole buoyant support for the marine craft. The rotary means includes a plurality of rotatable drumlike members having a plurality of outwardly extending vanes. The vanes have a volume adjacent the outer ends thereof substantially greater than the volume of the vanes adjacent the inner ends thereof whereby the vanes thus provide maximum buoyancy while permitting propulsion of the vehicle when disposed in water.

3,594,097

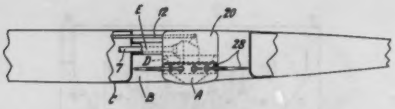
VARIABLE PITCH PROPELLER OR ROTOR

Rene Mouille, Aix-en-Provence; Charles Tresch, Eguilles, and Daniel Mao, Marseille, all of, France, assignors to Sud-Aviation, Societe Nationale De Constructions Aeronautiques, Paris, France

Filed July 3, 1969, Ser. No. 838,798
Claims priority, application France, July 11, 1968, 158,807
Int. Cl. B63h *1/20;* B64c *27/44*
U.S. Cl. 416—104 2 Claims

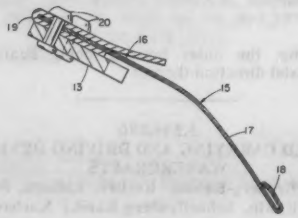
The invention is concerned with a root for the blade of a

variable pitch rotor, usually the drive torque compensating rotor for a helicopter. The root has a cylindrical portion



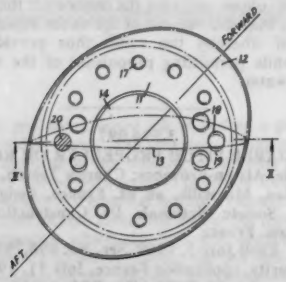
slidable and rotatable in a plastic sleeve partially embedded in a hub.

3,594,098
FAN WITH WEIGHTED FLEXIBLE BLADES
Shrinivas V. Pratinidhi, Chatham, Ontario, Canada, assignor to Fram Corporation, East Providence, R.I.
Filed Sept. 15, 1969, Ser. No. 857,849
Claims priority, application Great Britain, Feb. 28, 1969, 11018/69
Int. Cl. F04d *29/38*
U.S. Cl. 416—132 **3 Claims**



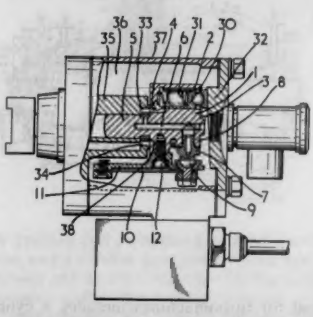
An automotive fan having flexible curved blades of resilient material which decamber as rotational speed increases in which an integral portion of each blade, having a mass of the order of 2 percent to 40 percent, preferably 8 percent to 10 percent, of the remainder of the blade, extends continuously along substantially the entire trailing edge of the blade and is folded upon itself at the trailing edge on the upstream side of the blade, thereby rigidifying and weighting the trailing edge to reduce vibration and noise and to assist the decambering of said blade at a predetermined rate.

3,594,099
PITCH ADJUSTMENT IN SCREW-BLADED DEVICES, SUCH AS PROPELLERS
Colin Wray Herbert, Marske-by-sea, Redcar, England, assignor to The Glacier Metal Company, Limited, Alperton, Wembley, England
Filed Apr. 25, 1969, Ser. No. 819,255
Claims priority, application Great Britain, Apr. 29, 1968, 20258/68
Int. Cl. B63h *3/12*
U.S. Cl. 416—207 **3 Claims**



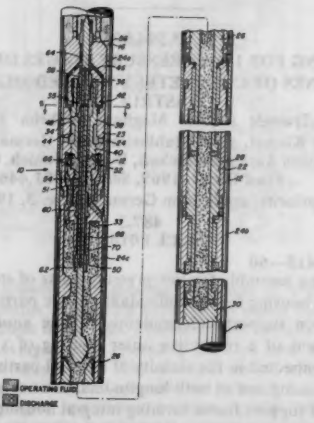
A propeller having a boss to which are bolted fixed blades which can be located at the required pitch by means of dowels engaging in pairs of registering holes in the boss and the blade root, a number of different sets of holes being provided to give different pitch settings.

3,594,100
ROTARY FUEL PUMP
Robert N. Penny, Solihull, England, assignor to The Rover Company Limited, Solihull, England
Filed Dec. 1, 1969, Ser. No. 881,164
Claims priority, application Great Britain, Dec. 19, 1968, 60,289/68
Int. Cl. F04b *1/12, 49/00;* **G05d** *13/10*
U.S. Cl. 417—270 **7 Claims**



A rotary fuel pump for supplying liquid fuel of the kind including a centrifugally operable spill valve operable to spill fuel back to pump inlet at a predetermined speed. When a pump of this kind is used to supply fuel to a gas turbine engine there may be a tendency for surging to occur when the pump and the engine are being accelerated prior to said spill valve opening. To reduce the tendency to surge, a second centrifugally operable spill valve is provided to open temporarily to reduce fuel delivery by the pump during acceleration prior to said spill valve opening.

3,594,101
REVERSE VALVE ASSEMBLY FOR FLUID-OPERATED DOWNWELL PUMPS
Peter S. Bloudoff, Whittier, Calif., assignor to Armco Steel Corporation, Middletown, Ohio
Filed Dec. 4, 1969, Ser. No. 882,022
Int. Cl. F04b *47/00;* **F01l** *15/12*
U.S. Cl. 417—403 **18 Claims**



A reverse valve assembly for fluid-operated downweli pumps comprising an elongated tubular valve spool, which is longitudinally disposed from the uppermost engine piston and mounted for reciprocal movement in the valve housing, and a longitudinal pilot rod attached to the uppermost engine

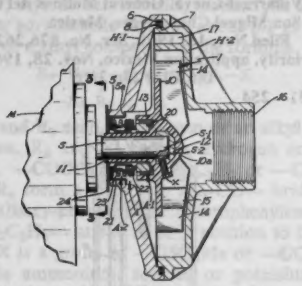
piston and extending through the valve spool. The valve spool is provided with lands thereon defining annuli communicating with operating fluid under pressure and with discharge, and the pilot rod is provided with interconnecting port means. As the pilot rod reciprocates, the signal for movement of the valve spool is provided through the port means and the area above the uppermost engine piston is alternately pressurized and exhausted, causing the engine to reciprocate.

3,594,102

WATER PUMP IMPELLER HAVING ELECTRICAL INSULATION AND CORROSION-PREVENTATIVE FEATURES

William A. Oden, Temple City, Calif., assignor to Domain Industries, Inc., New Richmond, Wis.

Filed Aug. 11, 1969, Ser. No. 848,829
Int. Cl. F04b *35/04*; **F16j** *15/54*
U.S. Cl. 417—423 **4 Claims**



An impeller for rotary water pumps and the like which through the provision of novel components and combinative relations with the driving shaft of an electric motor, inherently accomplishes two important new results, to wit:

1. The housing of the pump and all water passing therethrough are dielectrically insulated from the metal driving element of the motor.

2. The motor shaft, from its terminal point to an area outside of the pump housing, is entirely enclosed within a protruding sleeve carried by the impeller, thus preventing accumulation of rust or other corrosion as well as eliminating electrolytic buildup on the motor shaft.

3,594,103

SUBSURFACE PUMP AND METHOD

Glen L. Hillis, Gainesville, Tex., assignor to United States Steel Corporation

Filed Jan. 8, 1970, Ser. No. 1,473
Int. Cl. F04b *21/08, 47/00*; **E21b** *43/00*
U.S. Cl. 417—435 **3 Claims**

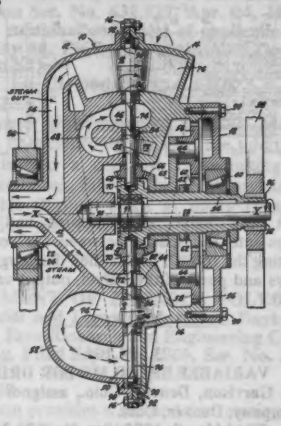
A subsurface pump and pumping method particularly for use in gassy oil wells to improve pumping efficiency and avoid gaslocks. A body of relatively gas-free fluid is trapped during each upstroke of the pump plunger. Gassy fluid coming directly from the well blends with this body to produce a blended fluid having a lower proportion of gas. The plunger encounters the blended fluid on its downstroke.

3,594,104

MULTIPLE STAGE ROTARY ENGINE

Jasper Speese, 59 Filbert St., Milton, Pa.

Filed Nov. 10, 1970, Ser. No. 88,466
Int. Cl. F01c *1/00, 1/30, 11/00*
U.S. Cl. 418—6 **10 Claims**



An engine comprising a rotatable casing, a plurality of circumferentially disposed variable volume chambers in said casing, said chambers being serially interconnected and defining a plurality of stages in said engine, means for introducing a motive fluid to rotate said casing into the inner of said chambers, means to exhaust said motive fluid from the outer of said chambers, a plurality of vane holder shafts mounted in a support member disposed in said casing, each of said vane holder shafts having a vane disposed in each of said chambers, said vane holder shafts being rotatable about their axes and being nonrotatable about the axis of rotation of said casing, the sizes and configurations of said variable volume chambers and of said vanes being correlated so that upon rotation of said casing and rotation of said vane holder shafts about their axes the edges of said vanes are maintained in close proximity with the walls of said variable volume chambers, and power takeoff means operatively connected to said rotatable casing.

3,594,105

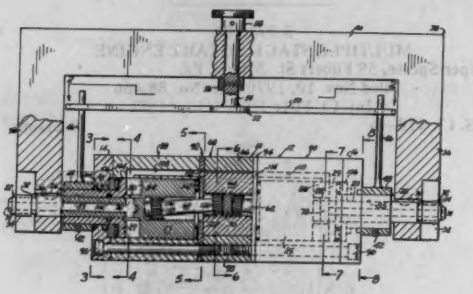
REVERSIBLE, VARIABLE SPEED, ROTARY CASING, ORBITAL GEAR ROTOR MOTOR

Eugene Richardson, Southfield, Mich., assignor to Lamina, Inc., Oak Park, Mich.

Filed June 23, 1969, Ser. No. 835,480
Int. Cl. F04c *1/02*
U.S. Cl. 418—61 **10 Claims**

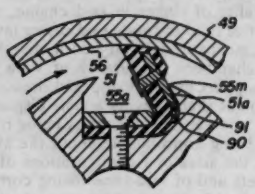
Axially spaced coaxial fluid inlet and outlet shafts are nonrotatably fixed to a supporting frame and have longitudinal fluid inlet and outlet passageways with transverse ports which communicate with cruciform transverse valve ports in inlet and outlet valve sleeves rotatably mounted on the inlet and outlet shafts with their corresponding ports rotated out of phase relatively to one another. Hubs secured to these inlet and outlet valve sleeves are mechanically connected to one another and to a control knob for rotation simultaneously relatively to one another in opposite directions from an aligned central neutral position to produce forward or reverse rotation of the casing. The inner ends of the shaft are provided with enlarged internally splined heads coupled to an externally toothed internally splined inner stator by a pair of double-headed externally splined drive links which switch, with the stator, oscillate but do not rotate. The rotary casing includes an internally toothed outer rotor meshing with the inner stator on an axis eccentric thereto and, axially spaced

fluid input and output barrels bolted thereto and provided with longitudinal fluid passageways which connect the valve sleeve ports with the spaces between the rotor and stator teeth. In operation, hydraulic pressure fluid flows through the



inlet shaft and valve sleeve ports and input barrel passageways into the spaces between the rotor and stator teeth, rotating the rotor. Fluid is then discharged through the passageways and ports of the barrel, output valve sleeve and output shaft.

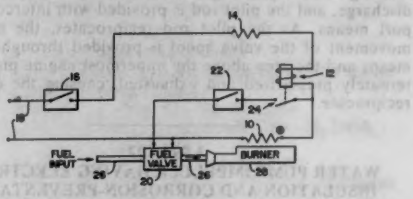
3,594,106
VARIABLE SPEED MOTOR DRILL
Marion A. Garrison, Denver, Colo., assignor to Empire Oil Tool Company, Denver, Colo.
Filed May 9, 1969, Ser. No. 823,301
Int. Cl. F01c *19/00*; F03b *13/02*
U.S. Cl. 418—202 **10 Claims**



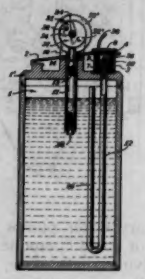
A down-hole rotary drilling tool adapted to be driven by hydraulic or pneumatic power with the latter under control of a centrifugal speed regulator establishing drilling speed independently of torque loads. The drilling tool being connected to drill pipe string for suspending the drill bit in formation has novel-type thrust and motor bearings, including load-modifying means responsive to compression or tension loads on shaft causing loads to be applied as compression loading on thrust bearing. Axially adjustable bearings for motor accept radial and thrust loads. Novel blade arrangement for rotor prevents binding from blade distortion due to pressure of flowing liquid. Pressure relief valve and internal rotating dump valve relieve against excessively high and minimum low pressures in flow through tool.

3,594,107
ELECTRIC IGNITION SYSTEM USING A PTC IGNITOR AS A SENSING MEANS
James R. Willson, Garden Grove, and Hugh J. Tyler, Santa Ana, both of, Calif., assignors to Robershaw Controls Company, Richmond, Va.
Filed Mar. 20, 1969, Ser. No. 808,840
Int. Cl. F23n *5/14*
U.S. Cl. 431—66 **26 Claims**

An electric ignition system for a fuel burner including an electrical resistance-type ignitor, wherein the resistance of the ignitor has a positive temperature coefficient and is connected in series with a ballast relay in parallel with the relay contacts and an electrically operated fuel valve, the latter being in the burner fuel supply line; the voltage drop of the energizing circuit for the valve and the ignitor varies according to the temperature of the ignitor for controlling operation of the burner supply line.

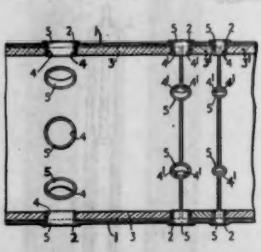


3,594,108
DISPOSABLE GAS LIGHTER
Edmundo Villarreal-Cueva, General Molinos del Campo 15-2, Colonia San Miguel Chapultepec, Mexico
Filed Nov. 13, 1969, Ser. No. 876,262
Claims priority, application Mexico, Nov. 28, 1968, 107,416
Int. Cl. F23q *2/16*
U.S. Cl. 431—254 **7 Claims**



A gaseous fuel disposable lighter filled through the flint support and having novel scraper and gas flow regulator construction. Means to prevent the dispensing of fuel in liquid form is also provided.

3,594,109
FLAME TUBE
Robert Noel Penny, Solihull, England, assignor to Leyland Gass Turbines Limited, Solihull, England
Filed June 27, 1969, Ser. No. 837,280
Claims priority, application Great Britain, July 27, 1968, 35974/68
Int. Cl. F23d *15/02*
U.S. Cl. 431—352 **2 Claims**



A frame tube for a gas turbine combustion chamber including at least one annular linear of a ceramiclike, refractory or other heat and flame resistant material positioned within a metallic outer wall, said liner having apertures therein in registration with holes in said metallic wall, and a plurality of bushes inserted into the holes in the metallic wall and through the registering apertures in said liner, the bushes being a loose fit in the apertures and being secured to the metallic wall to hold said liner from circumferential and axial movement within the flame tube except for limited movements necessary to permit thermal expansion and contraction of the metallic wall relatively to said liner.

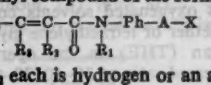
CHEMICAL

3,594,110
PROCESS FOR DYEING SHAPED ACRYLONITRILE COPOLYMERIZATES

Wilhelm Happe, Schwalbach, Taunus, Erich Heitzer, Königstein, Taunus, Stefan Müllner, Frankfurt am Main, and Helmut Rinno, Lorsbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 19, 1968, Ser. No. 706,615
Claims priority, application Germany, Feb. 28, 1967, F 51,667
Int. Cl. D06p *1/18*
U.S. Cl. 8—4 **8 Claims**

A process for fast dyeing a shaped article of a copolymerizate of (a) styrene-acrylonitrile, methacrylic acid lower alkyl ester or acrylonitrile and (b) about 0.1 to about 5.0 mol percent of a vinyl compound of the formula



wherein R_1 and R_2 each is hydrogen or an alkyl of 1 to 4 carbon atoms, R_3 and R_4 each is hydrogen or a group $—COOCH_3$, $—COOC_2H_5$, $—COOC_3H_7$ or $—COOC_4H_9$, or R_1 and R_4 form a ring with a —CO— bridge, Ph is phenylene, alkoxy-phenylene or chlorophenylene, A is a group $—SO_2C_2H_4—$ at the m or p position to the amido group, and X is a group of $—OSO_2Me$ or $—OCOCH_3$ in which Me is ammonium, sodium or potassium, which comprises treating said shaped article with an aqueous solution or dispersion of a monoazo dyestuff having a reactive hydrogen atom at a temperature of about 90° C. to about 120° C. at a pH of about 5 to about 10.

3,594,111
METHOD OF DYEING THE SURFACE OF PLASTIC ARTICLES

Harold A. Wittcoff and William S. Baldwin, Minneapolis, Minn., assignors to General Mills, Inc.

No Drawing. Filed Mar. 25, 1968, Ser. No. 715,522
Int. Cl. D06p *1/00*
U.S. Cl. 8—4 **8 Claims**

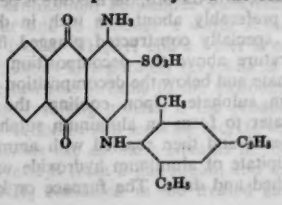
The surface or a portion thereof of a plastic article is altered with an organophilic clay obtained by replacing inorganic cations of montmorillonite clays with substituted ammonia cations. The resulting treated plastic is then dyed with a solvent dye.

3,594,112
DYEING, PADDING AND PRINTING OF SYNTHETIC POLYAMIDE FIBERS WITH AN ANTHRAQUINONE DYE

Jacques Guenthard, Binningen, Basel-Land, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 607,142, Jan. 4, 1967. This application May 22, 1968, Ser. No. 731,327
Claims priority, application Switzerland, Feb. 2, 1966, 1,441/66; Mar. 16, 1966, 3,807/66
Int. Cl. C09b *1/00*
U.S. Cl. 8—39 **8 Claims**

A dyeing, padding and printing process for polyamide fibers with the anthraquinone dye of the formula



3,594,113
BACTERIOSTATIC FINISH FOR CELLULOSIC FABRICS

Leonard Lifland, Wellesley Hills, Mass., and Leonard A. Stanley, Charlotte, N.C., assignors to The Kendall Company, Walpole, Mass.

No Drawing. Continuation-in-part of application Ser. No. 774,509, Nov. 8, 1968, which is a continuation-in-part of application Ser. No. 632,927, Apr. 24, 1967, which in turn is a continuation-in-part of application Ser. No. 457,437, May 20, 1965. This application Dec. 3, 1969, Ser. No. 881,843
Int. Cl. D06m *13/34, 13/02*
U.S. Cl. 8—115.6 **5 Claims**

A fine aqueous dispersion of a phenolic bacteriostatic agent such as hexachlorophene, with the addition of zirconium acetate and a cellulose cross-linking agent, is cured onto a cellulosic fabric. The resulting bacteriostatic finish is durable through twice as many launderings as a finish omitting the cross-linking agent.

3,594,114
PRETREATMENT OF DYEABLE POLYOLEFINS

Albert J. Shmidl and Leroy C. Jennings, Baytown, Tex., assignors to Esso Research and Engineering Company

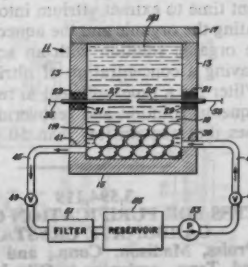
No Drawing. Filed Sept. 30, 1966, Ser. No. 583,475
Int. Cl. D06p *5/00*
U.S. Cl. 8—168 **13 Claims**

This invention provides a method for treating a dyeable polyolefin fiber before a dyeing step, which comprises contacting the dyeable polyolefin fiber with a specific liquid treating fluid. The fluid consists essentially of 100 parts by weight made up as follows: from 98 to 80 parts by weight of acetic acid having a concentration from 40 weight percent aqueous to glacial, and from 2 to 20 parts by weight of an acid chosen from the group consisting of substantially water insoluble C_8 to C_{12} alkanoic acids. The treating conditions include a pressure sufficient to maintain the treating fluid in the liquid phase, a temperature from about 75° F. to about 175° F., and a treating time from about 1 minute to about 5 minutes. Suitably, the treating step is followed by conventional acid dyeing.

3,594,115
BACTERIA DESTRUCTION METHODS

Richard H. Wesley and Glen T. Williams, Fort Worth, Tex., assignors to Electro-Hydraulics Corporation, Fort Worth, Tex.

Continuation of abandoned application Ser. No. 312,526, Sept. 30, 1963. This application Feb. 9, 1968, Ser. No. 704,490
Int. Cl. A61l *9/00*; A23l *3/00*; B01d *35/20*
U.S. Cl. 21—54 **19 Claims**



Methods to destroy bacteria for various applications including food preservation, vaccine preparation and sewage treatment. Methods involve confining matter to be treated in a closed receptacle which is capable of withstanding high intensity shock wave impulses and high pressure build-up, filling the receptacle with a non-gaseous fluid

(if the matter being treated is in liquid form, then the receptacle will already be filled with non-gaseous fluid), and discharging from electrodes within the receptacle a quantity of electric energy, with the parameters of energy quantity, discharge time duration, and discharge current being within specified ranges to produce high intensity shock wave impulses and high pressure build-up within the fluid.

3,594,116

DITIN(II)ZIRCONIUM(IV)OCTAFLUORIDE OR TRIFLUOROZIRCONIUM PENTAFLUOROSTANNITE

John D. Donaldson, Richmond, England, assignor to Ozark-Mahoning Company, Tulsa, Okla.

Filed Nov. 22, 1968, Ser. No. 778,095
Int. Cl. C22b *59/00*
U.S. Cl. 23—20 3 Claims

A new composition of matter comprising ditin(II)zirconium(IV)octafluoride (or trifluorozirconium pentafluorostannite having the formula $2SnF_2:ZrF_4$ and methods of preparing the said composition.

3,594,117

PROCESS FOR REMOVING CERIUM AND THORIUM FROM THE OTHER RARE EARTH METALS

Vincent Chiola and George J. Kamin, Towanda, Pa., assignors to Sylvania Electric Products Inc.

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,030
Int. Cl. C22b *59/00;* C01f *17/00*
U.S. Cl. 23—22 10 Claims

A process for separating impurities selected from the group consisting of cerium, thorium and mixtures thereof from an impure material useful for cathodoluminescent phosphor production is disclosed, the process comprising a dissolution of said impure material in a mineral acid, oxidizing said impurities, forming the insoluble iodates of said impurities and removing the impurities as solid iodates from the solution containing the purified luminescent materials.

3,594,118

SEPARATION OF YTTRIUM AND CERIUM

Phyllis R. Dodds, Wysox, Pa., assignor to Sylvania Electric Products Inc.

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,031
Int. Cl. C22b *59/00;* C01f *17/00*
U.S. Cl. 23—23 3 Claims

A process for recovering a purified material containing yttrium values from an impure material containing yttrium and cerium is disclosed. The process comprises dissolving the impure material in an aqueous solution of a mineral acid having a critical concentration of acid, contacting the resulting solution with an organic solution containing a critical concentraton of di-2-ethylhexyl phosphoric acid for sufficient time to extract yttrium into the organic solution, separating the organic and the aqueous solutions, contacting the organic solution with an aqueous nitric acid solution having a concentration of nitric acid of at least 3.5 moles/liter for a time sufficient to remove the yttrium into the aqueous solution and recovering the purified yttrium values that contain less than 50 p.p.m. of cerium.

3,594,119

PROCESS FOR PURIFICATION OF SODIUM CARBONATE CRYSTALS

Carl E. Pruiss, Madison, Conn., and James M. Ford, Cleveland, Tenn., assignors to Olin Mathieson Chemical Corporation

Filed Jan. 2, 1969, Ser. No. 788,563
Int. Cl. C01d *7/22*
U.S. Cl. 23—63 7 Claims

Impure solid sodium carbonate monohydrate, formed by hyldrating light soda ash in the solid phase with sufficient water to form the monohydrate, is purified by digesting a slurry of the impure crystals in an aqueous solution saturated with sodium carbonate monohydrate at temperatures below the transition point of the monohydrate to anhydrous sodium carbonate and separating the thus purified crystals of monohydrate from the slurry. Purified dense ash is produced by dehydrating the purified monohydrate.

3,594,120

ANHYDROUS MAGNESIUM CHLORIDE

Lawrence L. Bott, Oak Park, Ill., and Richard L. Craig, Edward A. Hunter, and Evan A. Mayerle, Lake Jackson, Tex., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,394
Int. Cl. C01f *5/30*
U.S. Cl. 23—91 5 Claims

In the so-called "Nalco-Freeport" process for the production of organolead compounds by the electrolytic decomposition of a sacrificial lead anode utilizing a mixture of anhydrous oxygenated solvents consisting preferably of the diethylether of tetraethylene glycol (DETEG) and tetrahydrofuran (THF) in the operable ratio 25–50/75–50; a preferred ratio of 30–40/70–60 and an optimum value of 35/65 by weight percent, with the consequent byproduction of anhydrous magnesium chloride ($MgCl_2$), the step and improvement which consists of separating and recovering magnesium values by treatment of the $MgCl_2$ with anhydrous ammonia to form a magnesium chloride ammine complex precipitate ($MgCl_2 \cdot XNH_3$, where X=1–6), separating the ammine complex from the solvent mix and decomposing the ammine under water-free muffled conditions by heating at 300°–400° C. for 10–16 hours to drive off the ammonia and recovering the consequent freed anhydrous $MgCl_2$.

3,594,121

DRY GEL PROCESS FOR PREPARING ZEOLITE Y

Willis W. Weber, Niagara Falls, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 484,116, Aug. 31, 1965. This application Mar. 10, 1969, Ser. No. 805,888
Int. Cl. C01b *33/28*
U.S. Cl. 23—111 4 Claims

Process for preparing zeolite Y using reaction mixture gels containing very low mole percentages of water and silica to the extent they contain so little water that they give the appearance of virtually dry to slightly moist powders. These gels permit the use of apparatus such as is conventionally used in dry solids handling.

3,594,122

PROCESS FOR EXTRACTION OF ALUMINA FROM ALUMINA-CONTAINING ORE

George Miller, Bogota, Colombia, assignor to Ethyl C. Fornes, Springville, N.Y.

Filed July 28, 1969, Ser. No. 845,169
Int. Cl. C01f *7/10;* C22b *1/06*
U.S. Cl. 23—143 6 Claims

Ammonium sulphate is added to alumina-bearing ore, such as clay, in stoichiometric proportion to the amount of alumina present in the ore, the mixture is pelletized, and the pellets, preferably about one inch in diameter are heated in a specially constructed plugged flow furnace to a temperature above the decomposition temperature of iron sulphate and below the decomposition temperature of aluminum sulphate. Upon cooling, the pellets are placed in water to form an aluminum sulphate solution which is filtered and then reacted with ammonia gas to form a precipitate of aluminum hydroxide which can be filtered, washed and dried. The furnace or kiln includes

upper and lower chambers of the same diameter and a reduced diameter intermediate chamber. Hot gases are introduced by tuyeres communicating with an annular space defined at the juncture between the intermediate and lower chambers. A rotating table in combination with adjustable drag bars both located below the lower chamber control the rate of flow of material through the furnace.

3,594,123

ENHANCEMENT OF GYPSUM CRYSTAL GROWTH IN WET-PROCESS PHOSPHORIC ACID

Frederick Ludwig Encke, Bronx, and Edward Helmut Sheers, Flushing, N.Y., assignors to Arizona Chemical Company, New York, N.Y.

Filed Aug. 10, 1967, Ser. No. 659,684
Int. Cl. C01b *25/22*; C01f *11/46*
U.S. Cl. 23—165 **6 Claims**

Improvements in wet-process phosphoric acid systems comprising adding a composition comprising (1) an adduct obtained by reacting ethylene oxide with tall oil rosin; with or without (2) fatty acids, whereby foam is suppressed and gypsum crystal growth is enhanced.

3,594,124

PROCESS FOR THE PREPARATION OF HYDROGEN

Gianfranco De Beni, Cadrezzate-Varese, Italy, assignor to European Atomic Energy Community (Euratom)

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,399
Claims priority, application Netherlands, Feb. 19, 1969, 6902604
Int. Cl. C01b *1/03, 1/07, 13/04*
U.S. Cl. 23—212 **2 Claims**

Hydrogen is prepared by a cycle of chemical reactions which comprise the reaction of mercury with hydrogen bromide with the formation of mercury bromide and hydrogen, the reaction of the mercury bromide formed with an alkaline earth hydroxide with the formation of an alkaline earth bromide, mercury oxide and water, the decomposition of the resulting mercury oxide into mercury and oxygen and the hydrolysis of the resulting alkaline earth bromide with the formation of alkaline earth hydroxide and hydrogen bromide, and that the reaction products mercury, hydrogen bromide and eventually alkaline earth hydroxide are returned to the cycle.

3,594,125

REMOVAL AND RECOVERY OF SULFUR FROM A GAS STREAM CONTAINING H_2S

Robert J. J. Hamblin, Deerfield, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 26, 1969, Ser. No. 802,356
Int. Cl. C01b *17/04*; C01c *1/20*
U.S. Cl. 23—224 **10 Claims**

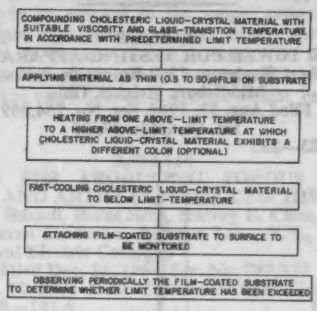
H_2S is removed from a gas stream and sulfur is produced by the steps of: (1) sequentially scrubbing the gas stream with a first recycle water stream containing NH_4OH and then with a second recycle water stream which is substantially free of NH_4OH to produce a treated gas stream which is reduced in H_2S content and is substantially free of NH_3 and a bottom water stream containing NH_4HS and NH_4OH; (2) catalytically treating the bottom water stream with an air stream to produce an effluent stream containing ammonium polysulfide; (3) treating the ammonium polysulfide-containing stream to recover sulfur and to produce a water stream which is substantially free of NH_4OH and a water stream containing NH_4OH; and, (4) separately recycling at least a portion of these last two streams to the scrubbing step. Key feature of the resulting process is the production in the regeneration section of two separate recycle water streams and the judicious use of these streams in the scrubbing step to remove H_2S from a gas stream and minimize the amount of NH_3 contained in the treated gas stream.

3,594,126

TEMPERATURE-LIMIT DETECTION

James L. Fergason, Kent, Ohio, and Newton N. Goldberg, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1969, Ser. No. 820,602
Int. Cl. C09k *3/00*; G01k *11/12*; G01n *31/22*
U.S. Cl. 23—230LC **14 Claims**


COMPOUNDING CHOLESTERIC LIQUID-CRYSTAL MATERIAL WITH SUITABLE VISCOSITY AND GLASS-TRANSITION TEMPERATURE IN ACCORDANCE WITH PREDETERMINED LIMIT TEMPERATURE
APPLYING MATERIAL AS THIN (0.5 TO 50 MIL) FILM ON SUBSTRATE
HEATING FROM ONE ABOVE-LIMIT TEMPERATURE TO A HIGHER ABOVE-LIMIT TEMPERATURE AT WHICH CHOLESTERIC LIQUID-CRYSTAL MATERIAL EXHIBITS A DIFFERENT COLOR (OPTIONAL)
FAST-COOLING CHOLESTERIC LIQUID-CRYSTAL MATERIAL TO BELOW LIMIT-TEMPERATURE
ATTACHING FILM-COATED SUBSTRATE TO SURFACE TO BE MONITORED
OBSERVING PERIODICALLY THE FILM-COATED SUBSTRATE TO DETERMINE WHETHER LIMIT TEMPERATURE HAS BEEN EXCEEDED

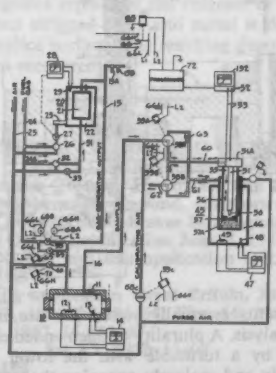
By using certain compositions of matter comprising liquid crystal material of the cholesteric phase having a viscosity controlled in accordance with a desired limit temperature, one can obtain an irreversible color change that serves as an indication that such limit temperature has been exceeded. Possible uses include packaging of frozen foods and determination of body temperatures. Cholesteric liquid-crystal material, microencapsulated and/or in thin-film form, is fast-cooled from an above-limit temperature at which it exhibits a characteristic color other than that which it has in the vicinity of the limit temperature, retaining its high-temperature color until the limit temperature is exceeded. Particular cholesteric-phase liquid-crystal materials amenable to such method, and practices for adjusting the viscosity in accordance with desired limit temperatures, are also taught. Articles of manufacture embodying such compositions are disclosed.

3,594,127

METHODS AND SYSTEMS FOR MONITORING AND/OR CONTROLLING THE CONSTITUENT-POTENTIAL OF HEAT - TREATING ATMOSPHERES

Raymond L. Davis II, Newtown Square, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

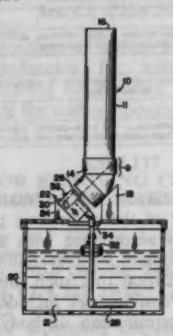
Filed May 24, 1968, Ser. No. 731,876
Int. Cl. C21d *1/00*; G01n *31/10*
U.S. Cl. 23—232 **11 Claims**



Various generically similar but specifically different methods and systems providing for accelerated response

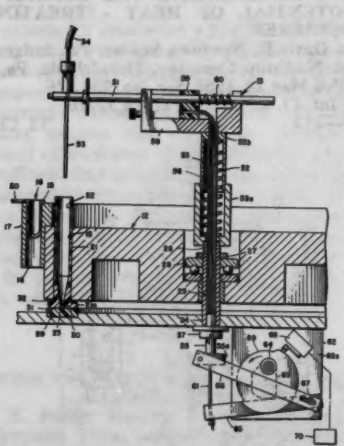
of a constituent-potential detector to changes in constituent-transfer ability by altering the atmosphere to the detector to form an atmosphere therearound having faster net constituent-transfer ability than the atmosphere sample normally conducted from a space, such as the work chamber of a heat-treating furnace which is being monitored or controlled, particularly a furnace employing a carburizing-type atmosphere.

3,594,128
FOG TOWER FOR TESTING APPARATUS
Albert Singleton, 7360 Brookside Parkway, Middleburg Heights, Ohio
Filed Aug. 23, 1968, Ser. No. 754,809
Int. Cl. G01n *17/00*
U.S. Cl. 23—253 **7 Claims**



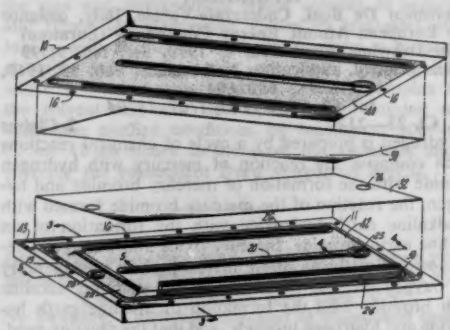
A fog tower for use with corrosion testing apparatus to conduct a flow of corrosive fog. At least one portion of the length of the tower extends transversely to the line of fog flow as the fog enters the tower or transversely to another portion of the tower which is substantially vertical.

3,594,129
SINGLE-CHANNEL ANALYZER
Alan Richardson Jones, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sept. 3, 1969, Ser. No. 854,968
Int. Cl. G01n *1/10, 1/14*
U.S. Cl. 23—253 **21 Claims**



An apparatus especially suited for use in automated chemical analysis. A plurality of open ended reaction tubes are carried by a turntable with the lower ends of the tubes slidably and sealingly engaging the contact surface of a platform. The chambers of the reaction tubes are therefore closed at their lower ends by the contact surface and standard clinical chemistry tests or reactions may thus be carried out in such chambers. Openings in the contact surface along the path of travel of the reaction tubes, in conjunction with conduits and apparatus communicating with such openings, result in the successive draining of each tube's contents, the colorimetric analysis of such contents, and the subsequent flushing and rinsing of each tube. A transfer mechanism coordinated in its operation with the turntable withdraws measured portions of fluid samples carried by cups supported by the turntable and discharges those measured portions along with a measured volume of a test reagent into the reaction tubes. Each reaction tube has a downwardly tapered chamber and, like the contact surface of the platform, is formed from a resilient plastic material which will insure a fluid-tight seal between the surfaces of the slidably-engaging parts.

3,594,130
BLOOD OXYGENATOR
Howard L. North, Jr., West Simsbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Mar. 24, 1969, Ser. No. 809,790
Int. Cl. A61m *1/03*
U.S. Cl. 23—258.5 **2 Claims**

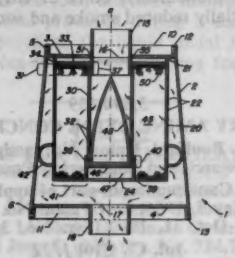


A thin film blood oxygenator usable with hyperbaric oxygen is constructed in two flat spaced plates sandwiching a pair of semipermeable membranes supported by glass beads whereby blood is passed between the semipermeable membranes and oxygen is passed over the outer surface of the membranes and between the glass beads. Channels formed in the flat plate serve to distribute the blood and oxygen in a predetermined flow path.

3,594,131
CATALYTIC CONVERTER
Ted V. De Palma, Roselle, and Martin W. Perga, Hoffman Estates, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Nov. 10, 1969, Ser. No. 875,279
Int. Cl. F01n *3/00, 3/14*
U.S. Cl. 23—288 **7 Claims**

A converter for catalytic conversion of fluid streams which embodies a catalyst retaining section having a reservoir section therein. The reservoir section is established by a partition that prevents flow of fluid through one part of the catalyst section. A flanged end of a movable perforate partition spans the catalyst bed and keeps all the catalyst material in a compacted state. In a preferred embodiment, a weighted bullet-shaped distribution means provides the pressuring means for keeping the flanged end in pressure contact with the catalyst material. As catalyst material shrinks or is lost by mechanical attrition or chemical spallation, the flanged end of the movable perforate partition forces fresh material from the reservoir

section to an area of the bed where fluid flow exists. In a modified embodiment, the movable perforate partition ex-



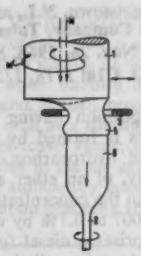
poses additional catalyst material to fluid flow at the other end of the catalyst section as catalyst material is lost.

3,594,132

METHOD OF CRUCIBLE-FREE ZONE MELTING A CRYSTALLINE ROD WITH LATERALLY DISPLACED ROD HOLDERS

Wolfgang Keller, Pretzfeld, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 27, 1967, Ser. No. 670,893
Claims priority, application Germany, Sept. 28, 1966, S 106,159
The portion of the term of the patent subsequent to Dec. 3, 1985, has been disclaimed
Int. Cl. B01j *17/10*
U.S. Cl. 23—301 5 Claims



Method of crucible-free zone melting a crystalline rod which comprises rotating a pair of spaced and substantially vertically aligned end holders supporting a crystalline rod therebetween, heating the rod with an annular heating device surrounding the rod to a temperature at which a molten zone is formed in the rod dividing the rod into a supply rod portion being supplied to the melt in the molten zone and a rod portion resolidifying from the melt, relatively displacing the end holders and the heating device in the direction of the rod axis at a given relative speed so that the resolidifying rod portion has a thickness of predetermined nominal value, and laterally displacing the end holder for the supply rod portion out of vertical alignment with the other end holder.

3,594,133

ALUMINUM ALLOY

Jacques F. Cote, William Ernest Cooke, and Roy C. Spooner, Kingston, Ontario, Canada, assignors to Alcan Research and Development Limited, Montreal, Quebec, Canada

No Drawing. Filed Nov. 3, 1967, Ser. No. 680,323
Int. Cl. C23f *1/00*
U.S. Cl. 29—183 3 Claims

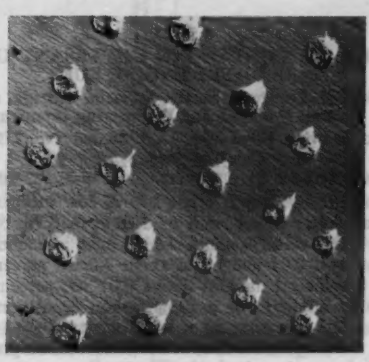
An aluminum base alloy capable of receiving an alkaline etch treatment to produce a uniform mat finish contains silicon in an amount in the range 0.2–0.6%, iron in the amount 0.35% max., manganese in the amount 0.10% max., magnesium in an amount in the range 0.45–0.9%, chromium in the amount 0.1% max., titanium in the amount 0.10% max., zinc in the amount in the range 0.03–0.25% and copper in an amount in the weight ratio 1:1 to 2:1 on a Cu-Zn weight basis ratio, others each in the amount 0.05% max., said others total in the amount 0.15% max., the remainder being aluminum, all the aforesaid percentages being percent by weight. Of the above-mentioned alloys when the zinc content is in the range 0.10–0.25% the copper should be present in an amount in the weight ratio 2:1 on a Cu-Zn weight basis ratio and, also, in the above alloys when zinc is present in an amount in the range 0.03–0.10% the copper should be present in an amount in the weight ratio 1:1 on a Cu-Zn weight basis ratio.

3,594,134

PROCESS FOR PRODUCING POROUS METAL FILMS AND ARTICLES PRODUCED THEREBY

Robert R. Russell, Burnt Hills, Harvey E. Cline, Latham, and Warren De Sorbo, Ballston Lake, N.Y., assignors to General Electric Company

Filed Dec. 30, 1968, Ser. No. 787,837
Int. Cl. B23p *1/00;* C23b *5/48;* B29c *17/08*
U.S. Cl. 29—191.4 19 Claims



A process for preparing a metallic film with substantially parallel and uniform apertures of small cross-section and uniform distribution useful as a filter. An alloy is cast which in the solid state is comprised of at least two phases. The cast alloy is directionally solidified to produce a body wherein one of the phases is present as a plurality of substantially parallel rods passing through a matrix comprised of the second or other phases. The directionally-solidified body is etched to remove the rodlike phase to form straight-through apertures or, if desired, recesses. A material is placed on an etched area of the etched body to form a negative replica of the recesses or holes. The material is then stripped away and metal is deposited on its negative replica surface. The resulting deposited metallic film is then recovered.

3,594,135

PRODUCTS FOR CHROMISING OF FERROUS METAL SUBSTRATES

Kenneth Urmston Holker, Harrogate, and Colin Paul Albon, Knaresborough, England, assignors to Albright & Wilson Limited, Oldbury, near Birmingham, England

No Drawing. Original application June 5, 1967, Ser. No. 643,734. Divided and this application Oct. 23, 1969, Ser. No. 871,370
Claims priority, application Great Britain, June 7, 1966 and Nov. 29, 1966, 25,416/66; Mar. 16, 1967, 12,445/67; Apr. 14, 1967, 16,641/67
Int. Cl. B32b *15/04*
U.S. Cl. 29—195 28 Claims

Ferrous metal workpiece having an adherent porous chromium metal-containing surface layer in metal to

metal contact with at least one surface of said workpiece and having an adherent metal halide-containing coating on said chromium metal-containing surface layer said metal halide being one that will react with iron.

3,594,136

SMOKE SUPPRESSANT ADDITIVES

Bernard H. Rosen, Little Silver, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,199
Int. Cl. C10l *1/18, 1/32*
U.S. Cl. 44—51 12 Claims

A smoke and soot suppressant additive for liquid fuel comprises an ether and a Group II–A metal carbonate. An especially suitable additive is barium carbonate and an alkyl ether of ethylene glycol, such as the dimethyl ether of ethylene glycol. Generally the carbonate is employed in amounts from about 0.1 to 1% by weight and the ether is employed in amounts from 0.1 to 1% by weight.

3,594,137

CRUDE OIL CONTAINING DISPERSANT USEFUL AS DIESEL ENGINE FUEL

Thorkild F. Lonstrup, Sarnia, Ontario, Canada, assignor to Esso Research and Engineering Company

No Drawing. Filed Nov. 27, 1968, Ser. No. 779,598
Int. Cl. C10l *1/22, 1/24, 1/32*
U.S. Cl. 44—51 10 Claims

Synthetic or natural crude oils of low inorganic salts and low sulfur content may be used as fuels for operating heavy duty diesel engines where these crude oils contain at least 0.01 and up to about 2.0 wt. percent, or at least a sufficient amount above 0.01 wt. percent to appreciably minimize or prevent carbon deposition in and on the fuel injectors, of at least one overbased alkaline earth metal sulfonate and/or the condensation product of an alkylene polyamine with organic mono or dicarboxylic acids or anhydrides thereof, wherein the acids or anhydrides have substituted therein a long chain alkenyl group of C_{40}–C_{250}, either or both additives being used as dispersants. Sulfur content of the crude oil should be below about 1.0 wt. percent and salt contents should be below about 3 pounds per thousand barrels of crude oil. The crude oil may be of paraffinic, asphaltic or mixed type.

3,594,138

SMOKE SUPPRESSANT ADDITIVES FOR PETROLEUM FUELS

Elmer J. Badin, Hightstown, N.J., assignor to Cities Service Oil Company, Bartlesville, Okla.

No Drawing. Filed Jan. 2, 1968, Ser. No. 694,830
Int. Cl. C10l *1/18*
U.S. Cl. 44—66 6 Claims

The invention disclosed herein is a liquid fuel composition comprising a liquid hydrocarbon fuel having a tendency to form soot and smoke on combustion and a metal salt of an alkanoic acid, wherein the concentration of metal salt is at least sufficient, usually from 0.05 to 5% by weight, to inhibit said tendencies. Especially suitable compositions include a diesel fuel having from about 0.3 to 2% by weight of barium 2-ethylhexanoate and a diesel fuel having from about 0.1 to 2% by weight of calcium 2-ethylhexanoate admixed therein. Further improvement in soot and smoke reduction is obtained in hydrocarbon fuels and particularly in diesel fuels, when an ether is additionally incorporated into the salt and fuel mixture. A diesel fuel having from about 0.1 to 0.5% by weight of barium 2-ethylhexanoate and from about 0.3 to 0.6% by weight of the monomethyl ether of ethylene glycol exhibits substantially reduced smoke and soot forming characteristics.

3,594,139

TERTIARY AMINE OXIDE CONCENTRATES

Roland A. Bouffard, Union, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 547,731, May 5, 1966, now Patent No. 3,387,953. This application Oct. 31, 1967, Ser. No. 3,387,953.
Int. Cl. C10l *1/22*
U.S. Cl. 44—72 9 Claims

A rust-inhibitor concentrate that can be handled satisfactorily at all normal blending temperatures throughout the year and that presents no blending problems when added to gasoline comprises 30 to 60 wt. percent of a tertiary amine axide, from 30 to 60 wt. percent of a liquid aromatic hydrocarbon of 7 to 10 carbon atoms having a boiling point in the range of 230 to 400° F., and from 5 to 20 wt. percent of an aliphatic monohydric or dihydric alcohol of from 6 to 13 carbon atoms.

3,594,140

SMOKE SUPPRESSANT FUEL MIXTURES

Elmer J. Badin, Higàtstown, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,219
Int. Cl. C10l *1/18, 1/24*
U.S. Cl. 44—76 11 Claims

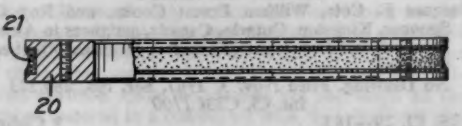
A liquid fuel composition having reduced soot and smoking characteristics is formed by admixing a major proportion of a liquid hydrocarbon fuel and a minor proportion, respectively, of an ether and a Group II–A metal sulfonate wherein the concentration of Group II–A metal is from about 0.007 to 0.1% by weight. A preferred fuel composition comprises a diesel fuel admixed with a barium alkaryl sulfonate and an alkyl ether of an alkylene glycol, said glycol ether having from 3 to 10 carbon atoms, wherein the concentration of barium metal is from about 0.04 to 0.08% by weight.

3,594,141

METHOD FOR MAKING A METAL BONDED DIAMOND ABRASIVE TOOL

Robert S. Houston and Reginald C. Fisk, West Boylston, Mass., assignors to Norton Company, Worcester, Mass.

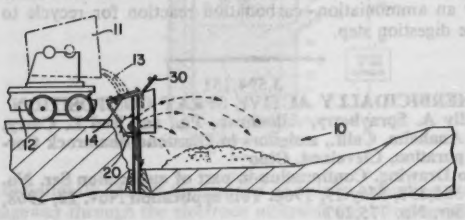
Continuation-in-part of application Ser. No. 296,553, July 22, 1963, which is a continuation-in-part of application Ser. No. 25,268, Apr. 28, 1960. This application Mar. 6, 1967, Ser. No. 620,717
Int. Cl. B24b *1/00*
U.S. Cl. 51—295 8 Claims



A method for making a metal bonded abrasive tool using powdered metal techniques, the tool having a controlled degree of relative hardness of its cutting action built into the tool during manufacture, the control being

accomplished by producing a specified porosity in the abrasive section of the tool, and then infiltrating the pores with liquified metal produced during a second phase of the sintering operation, the liquid metal for infiltrating being drawn from the support backing for the abrasive tool.

3,594,142
PROCESSES FOR THE PELLETIZATION OF METALLURGICAL SLAG
Richard D. Margesson, Burlington, Ontario, and William G. England, Grimsby, Ontario, Canada, assignors to National Slag Limited, Hamilton, Ontario, Canada
Filed June 5, 1968, Ser. No. 734,723
Int. Cl. C03b *5/18*
U.S. Cl. 65—19 **7 Claims**



In a process for the production of generally-spherical pellets from blast furnace slag a stream of molten slag is mixed with water to initiate its foaming and/or expansion; the slag and water mixture flows over the surface of a cooled plate and is then projected into the air by a projecting device such as a rotating drum provided with radially-extending concave vanes; the motion of the expaned pyroplastic slag in the air causes it to form spherical pellets that are sufficiently cooled to retain their individual identities upon reaching the ground.

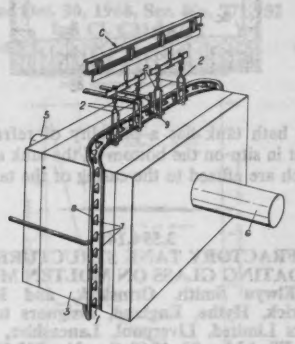
3,594,143
PROCESS OF FLOATING GLASS ON MOLTEN METAL WITH A PARTICULAR ATMOSPHERE
Iftikhar Mohyuddin, Ormskirk, England, assignor to Pilkington Brothers Limited, Liverpool, Lancashire, England
No Drawing. Filed June 27, 1968, Ser. No. 740,461
Claims priority, application Great Britain, June 30, 1967, 30,385/67
Int. Cl. C03b *18/02*
U.S. Cl. 65—32 **2 Claims**

Glass is heated whilst in contact with a protective atmosphere which comprises hydrogen and methane, the methane being in a proportion of from 1% to 50% of the hydrogen present in order for a condition of equilibrium to be maintained to inhibit any reaction between the hydrogen and the elements which could be attacked thereby, such, for example, as carbon and silicon carbide.

3,594,144
DISPERSING VEHICLE USED IN GLASS BONDING
Salvatore J. Acello, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.
No Drawing. Filed Oct. 10, 1968, Ser. No. 766,639
Int. Cl. C03c *27/00*
U.S. Cl. 65—43 **2 Claims**

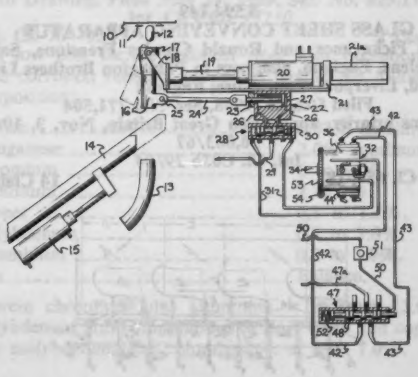
The assembly of parts of an integrated assembly by a bond between the parts is achieved by the application of a composition which is solder glasses, ceramics, or metals in fine powder form which are dispersed in fluorinated ether vehicle. The vehicle is removed and the parts bonded by fusion.

3,594,145
METHOD AND APPARATUS FOR FIRE POLISHING THE EDGE OF A GLASS SHEET WHILE BENDING
Solomon Elijah Kay, Solihull, England, assignor to Triplex Safety Glass Company Limited, London, England
Filed Mar. 17, 1969, Ser. No. 807,515
Claims priority, application Great Britain, Mar. 20, 1968, 13,544/68
Int. Cl. C03b *29/02*
U.S. Cl. 65—104 **13 Claims**



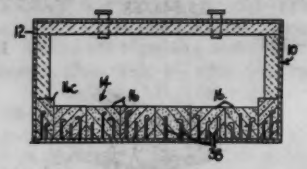
In the treatment of a glass sheet having a sharp edge, the glass sheet is heated preparatory to bending, the hot sheet is bent, and during or after bending a continuous peripheral margin of the sheet is exposed and further heat is applied to the margin to round the edge of the sheet.

3,594,146
MOLD CHARGE HANDLING APPARATUS
Urban P. Trudeau, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Nov. 1, 1968, Ser. No. 772,709
Int. Cl. C03b *5/30*
U.S. Cl. 65—165 **7 Claims**



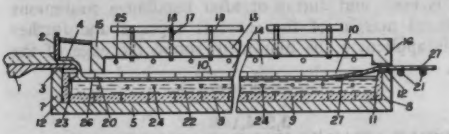
Apparatus for handling feeder-formed glass mold charges or "gobs" in which segregrated gobs initially follow a downward vertical path on their way to the sections of an IS-type forming machine, there being a piston-motor operated gob deflector near or encircling said path and a timer and air-conduit arrangement including control-valves, one manually controlled, to regulably actuate the piston-motor for the purpose of positioning the deflector so as to prevent delivery of gobs to a selected section or sections, for any desired period of time.

3,594,147
FLOAT BATH TANK CONSTRUCTION AND METHOD OF MAKING THE SAME
William F. Galey, Saxonburg, and John E. Sensi, Arnold, Pa., assignors to PPG Industries, Inc.
Filed Dec. 1, 1967, Ser. No. 687,363
Int. Cl. C03b 18/02
U.S. Cl. 65—182 4 Claims



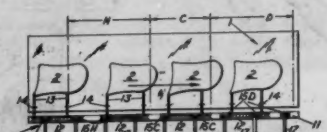
A float bath tank has a plurality of refractory lining blocks cast in situ on the bottom of the tank around metal studs which are affixed to the casing of the tank.

3,594,148
REFRACTORY TANK STRUCTURE FOR FLOATING GLASS ON MOLTEN METAL
Charles Elwyn Smith, Ormskirk, and Ian William McKittrick, Hythe, England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England
Filed May 20, 1968, Ser. No. 730,312
Claims priority, application Great Britain, May 25, 1967, 24,344/67
Int. Cl. C03b 18/02
U.S. Cl. 65—182 6 Claims



In the float process for the manufacture of flat glass, the tank structure containing a molten metal bath is lined with an alumino-silicate refractory.

3,594,149
GLASS SHEET CONVEYING APPARATUS
Alan Pickavance and Ronald Charles Freestone, Saint Helens, England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England
Filed Oct. 29, 1968, Ser. No. 771,504
Claims priority, application Great Britain, Nov. 3, 1967, 50,063/67
Int. Cl. C03b 29/04
U.S. Cl. 65—182 14 Claims



A conveyor for conveying articles such as glass sheets along a path, e.g. through a furnace, at different translational speeds comprises an elongated carriage member which is moved linearly along said path by engagement with successive drive wheels spaced along the path and arranged in at least two sets driven at different rotational speeds. The drives to at least some of the wheels of a set include free-wheel or slipping drive transmission to permit over-running of said wheels during a speed transition of the carriage when moving from one set of drive wheels to another.

3,594,150
PREPARATION OF SOLID MIXED FERTILIZERS AND AMMONIUM NITRATE
Raybon C. Cannon, Decatur, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.
No Drawing. Filed June 27, 1968, Ser. No. 740,449
Int. Cl. C05b 11/06, 11/12
U.S. Cl. 71—39 9 Claims

In a process wherein phosphate rock is digested with nitric acid and ammonium sulfate, and precipitated gypsum removed, water-soluble low $N:P_2O_5$ ratio mixed fertilizers and ammonium nitrate are produced by crystallizing and separating ammonium nitrate from the concentrated mother liquor containing the ammonium nitrate and phosphoric acid and then ammoniating the liquor containing the phosphoric acid and uncrystallized ammonium nitrate. The gypsum after removal from the digestion slurry may be converted to ammonium sulfate by an ammoniation-carbonation reaction for recycle to the digestion step.

3,594,151
HERBICIDALLY ACTIVE SPRAY COMPOSITION
Billy A. Sprayberry, Allentown, Pa., and Ted L. Curry, Anaheim, Calif., assignors to Diamond Shamrock Corporation, Cleveland, Ohio
No Drawing. Continuation-in-part of application Ser. No. 551,238, May 19, 1966. This application Nov. 12, 1968, Ser. No. 775,207
Int. Cl. A01n 9/00
U.S. Cl. 71—65 3 Claims

A pesticidally active composition for vegetation and insects, and particularly desirable for spray application, is prepared as a lump-free stable dispersion exhibiting thixotropic properties and having viscosity at a given solids content greater than the additive viscosities of individual components of the mixture at the same solids concentration. The preparative steps typically include forming an admix of 20–80 weight percent heteropolysaccharide and 80–20 weight percent locust bean gum, using this with a minor amount of surface active agent, combining these materials, preferably as a premixed homogeneous blend, with an organic liquid to prepare a free-flowing slurry, and mixing the slurry with an aqueous medium to make a sprayable system. Most pesticidal agents are then added to the sprayable system.

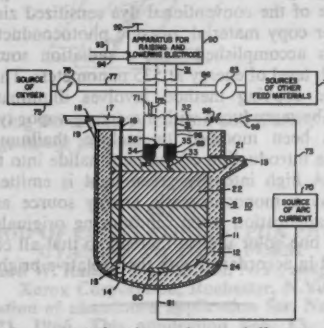
3,594,152
METHOD OF PRODUCING CYTOPLASMIC MALE STERILITY IN MAIZE
Dmitry Fedorovich Petrov, Sovetskaya, ulitsa 7, kv. 39; Ekaterina Sergeevna Fokina, Tsvetnoi proezd 17, kv. 49; and Natalia Borisovna Zheleznova, Morskoi prospekt 13, kv. 18, all of Novosibirsk, U.S.S.R.
No Drawing. Filed Sept. 21, 1967, Ser. No. 669,407
Int. Cl. A01n 9/00
U.S. Cl. 71—88 3 Claims

A method of producing cytoplasmic male sterility in maize by using the antibiotic streptomycine to cause a mutation of extrachromosomal genes which is known for the monocellule alga Chlamydomonas.

3,594,153
COPPER ORE REDUCTION AND METAL REFINING PROCESS
Serafino M. De Corso, Media, Pa., and Peter F. Kienast, Phoenix, Ariz., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 554,427, June 1, 1966. This application June 18, 1970, Ser. No. 47,296
Int. Cl. C22d 7/00, 7/08
U.S. Cl. 75—10 26 Claims

Processes for performing any one or more, or all of the steps required for reducing raw copper ore and obtaining refined pure copper, in which all essential steps of

the process may be carried out with a single crucible or ladle, or a number of crucibles may be utilized, each for one or more steps. For heating, an electric arc is formed from and between the uppermost portion of the conductive material in the crucible, whether ore, matte, blister, or copper, and an electrode is employed having a tip composed of substantially pure copper forming an arcing surface, with magnetic field coil means in the tip to set up a magnetic field to move the arc substantially



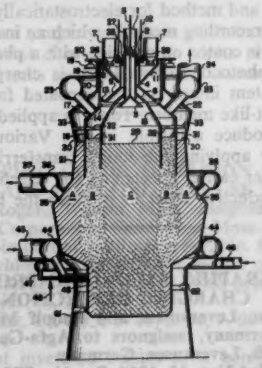
continuously around the tip, and an axially extending passageway through the electrode utilizable for bringing into the crucible or into the melt ore, oxygen, matte, iron, blister copper, a reducing agent, or any other material essential to one or more of the processes or steps. Normally the arcing surface is spaced from the upper surface of the melt, except for certain special operations. Refined copper is tapped from the bottom of the crucible, and slag as formed is periodically removable by a spout on the crucible, which may be tilted.

3,594,154

IRON MAKING PROCESS AND ITS ARRANGEMENT THEREOF

Tatsuro Kanokogi, Kyoto-shi, Japan, assignor to Sumitomo Metal Industries Ltd., Higashi-ku, Osaka-shi, Japan

Filed May 14, 1968, Ser. No. 729,048
Claims priority, application Japan, May 20, 1967, 42/32,215; Dec. 20, 1967, 42/82,135
Int. Cl. C21b *5/06*
U.S. Cl. 75—41 **6 Claims**



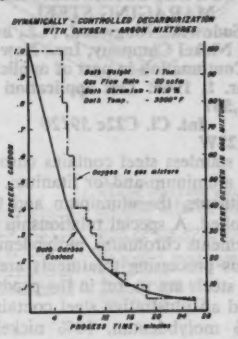
An improved process for iron making and arrangements thereof characterized in that fuel and ore burden are charged into a smelting shaft furnace so as to form three separate vertical zones of central columnar fuel zone, an intermediate annular ore material zone and an annular fuel zone along the inner wall surface of the furnace, a part of extracted furnace gases is thermally heated, reformed and recycled together with oxygen and fuel through tuyeres into the furnace. Pig iron is produced at a high rate, with low consumption of fuel and the operation is smooth.

3,594,155

METHOD FOR DYNAMICALLY CONTROLLING DECARBURIZATION OF STEEL

Sundaresan Ramachandran, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Brackenridge, Pa.

Filed Oct. 30, 1968, Ser. No. 771,752
Int. Cl. C21c *5/32*
U.S. Cl. 75—60 **6 Claims**


DYNAMICALLY - CONTROLLED DECARBURIZATION WITH OXYGEN - ARGON MIXTURES
PERCENT CARBON
PERCENT OXYGEN IN GAS MIXTURE
PROCESS TIME, minutes

Described herein is a method of dynamically controlling decarburization of steel by measuring the rate of carbon removal from the steel, measuring the rate of oxidizer input, continuously maintaining a balance between the aforementioned rates by adjusting the carbon-oxygen reation rate and/or adjusting the input of oxidizing material to the steel.

3,594,156

STAINLESS STEEL

Henry P. Leckie, Griffith, Ind., and Eugene Williams, Pittsburgh, Pa., assignors to United States Steel Corporation

No Drawing. Filed May 29, 1969, Ser. No. 829,110
Int. Cl. C22c *37/10*
U.S. Cl. 75—124 **2 Claims**

A low cost ferritic stainless steel with exceptionally good corrosion resistant properties having the following composition:

Carbon	0.03% maximum.
Manganese	2.0% maximum.
Chromium	6 to 12%.
Aluminum	2 to 7%.
Copper	0.1 to 1.5%.
Molybdenum	0.2 to 3.0%.
Columbium	0.2 to 3.0%.
Iron	Balance.

wherein chromium plus aluminum is at least 13.0%, molybdenum plus columbium is at least 0.8% and copper plus molybdenum plus columbium is at least 1.0%.

3,594,157

ALKALINE CHLORINATION OF WASTE PHOTOGRAPHIC PROCESSING SOLUTIONS CONTAINING SILVER

Thomas N. Hendrickson and Thomas J. Dagon, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 19, 1969, Ser. No. 851,464
Int. Cl. C22b *11/06*
U.S. Cl. 75—112 **7 Claims**

Waste photographic processing solutions which contain silver thiosulfate complex, such as exhausted thio-

sulfate fixing solutions, are chlorinated under alkaline conditions to precipitate a silver-bearing sludge from which the silver can be separated and to destroy thiosulfate ion and thereby reduce the oxygen demand of the solution. Chlorination can be effected by introduction of chlorine gas or by use of hypochlorite solution. Since thiosulfate ion accounts for a major part of the oxygen-consuming material which is discharged in photographic processing, a significant source of water pollution is substantially eliminated by this method.

3,594,158

STRONG, TOUGH, CORROSION RESISTANT MARAGING STEEL

Edward Peter Sadowski, Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 530,785, Mar. 1, 1966. This application Apr. 5, 1967, Ser. No. 628,567

Int. Cl. C22c *39/20*

U.S. Cl. 75—128W **7 Claims**

A maraging stainless steel contains chromium, molybdenum, nickel, aluminum and/or titanium, and carbon as essential constituents, the aluminum and titanium being specially controlled. A special relationship is given in respect of the elements chromium, molybdenum, and nickel whereby various processing treatments are rendered unnecessary. The steels are useful in the production of pressure vessels and an illustrative steel contains about 11% chromium, 2% molybdenum, 10% nickel, 0.25% aluminum, 0.2% titanium, up to 0.02% carbon, the balance being principally iron.

3,594,159

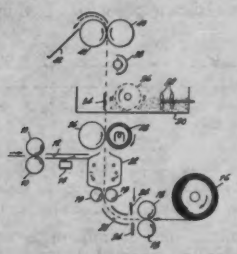
ELECTROSTATIC COPYING METHOD EMPLOYING DEVELOPMENT ON SIDE OF THE IMAGING SHEET OPPOSITE THE PHOTOCONDUCTIVE COATING

Arthur L. Kaufman, 26 High Point Road, Westport, Conn. 06880

Continuation-in-part of applications Ser. No 434,078, Feb. 19, 1965, Ser. No. 541,902, Mar. 22, 1966, and Ser. No. 747,163, July 24, 1968. This application Mar. 9, 1970, Ser. No. 17,810

Int. Cl. G03g *13/22*

U.S. Cl. 96—1 **12 Claims**



Method and apparatus for electrostatic reproduction of indicia, wherein a sheet of record material having an insulating substrate and a coating of photoconductive material on one side thereof is electrically charged, the photoconductive side is then exposed to light coming from the indicia to form a latent image, an electrical connection is established between the exposed photoconductive coating and a body of electrostatically attractable toner, the toner is applied to the substrate on the side opposite the photoconductive coating to render the latent image visible.

3,594,160

METHOD FOR EXPOSING PHOTOCONDUCTIVE MATERIALS WITH A MERCURY-THALLIUM VAPOR LIGHT SOURCE

Robert L. Gunto, Moundsville, W. Va., and Merton R. Staley, Palatine, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Continuation-in-part of application Ser. No. 653,090, July 13, 1967. This application June 30, 1970, Ser. No. 51,315

Int. Cl. G03c *13/04, 15/04*

U.S. Cl. 96—1 **5 Claims**

Exposure of the conventional dye sensitized zinc oxide resin binder copy material, organic photoconductors and selenium is accomplished with a radiation source that emits a high level of energy at 535 nanometers. The photoelectrostatic copying method involves illuminating the original to be reproduced with a mercury-vapor type lamp which has been modified to include thallium vapors through the introduction of thallium halide into the lamp envelope. A high intensity green light is emitted which performs as a monochromatic energy source and finds particular application when reproducing originals having more than one color indicia thereon so that all colors are reproduced in accordance with their relative brightness on the original.

3,594,161

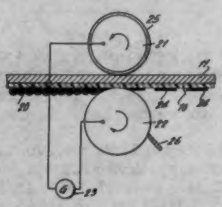
METHOD OF ELECTROPHOTOGRAPHY WITH DEVELOPMENT ON THE SUBSTRATE SURFACE OF THE PHOTOCONDUCTIVE ARTICLE

Arthur L. Kaufman, 26 High Point Road, Westport, Conn. 06880

Continuation-in-part of abandoned application Ser. No. 434,078, Feb. 10, 1965. This application July 24, 1968, Ser. No. 747,163

Int. Cl. G03g *13/22*

U.S. Cl. 96—1 **13 Claims**



Apparatus and method for electrostatically reproducing images upon recording media in which an insulating sheet-like member is coated on one side with a photoconductive layer. The photoconductive layer is charged so as to produce a latent image on the uncoated face of the insulating sheet-like member. Toner is applied to the latent image to produce a visible image. Various means are disclosed for applying the toner, transferring the latent image to other carrier sheets and for selectively charging the photoconductive sheet to produce the latent image.

3,594,162

ELECTROGRAPHIC RECORDING PROCESS WITH CHARGING DEFLECTION

Walter Simm, Leverkusen, and Rudolf Müller, Deisenhofen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 13, 1968, Ser. No. 775,285

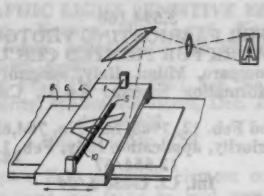
Claims priority, application Germany, Nov. 22, 1967, P 16 71 522.3

Int. Cl. G03g *13/22*

U.S. Cl. 96—1 **7 Claims**

The image-wise charging of recording materials in which a corona discharge current constant in time is directed from an electrode through a gap in a metal screen toward a recording material. The gap has along a lip a

means for producing a variable electric field transversely across the gap which variable electric field is capable of deflecting the discharge current and thereby controlling the charge image production.



3,594,163

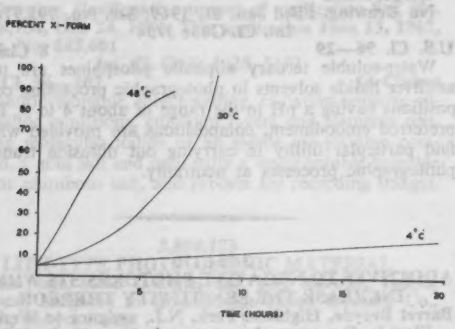
METHOD OF CONVERTING ALPHA PHTHALOCYANINE TO THE X-FORM

Richard W. Radler, Jr., Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation of abandoned application Ser. No. 566,839, July 21, 1966. This application Feb. 13, 1970, Ser. No. 10,077

Int. Cl. C09b 47/04

U.S. Cl. 96—1.5 9 Claims



A method of preparing X-form phthalocyanine which comprises crystal conversion from alpha phthalocyanine in organic solvents seeded with small amounts of X-form is disclosed.

3,594,164

PHOTOGRAPHIC COLOR DIFFUSION TRANSFER PROCESS AND FILM UNIT FOR USE THEREIN

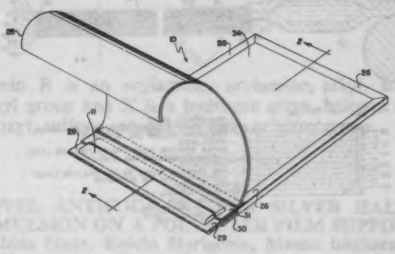
Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

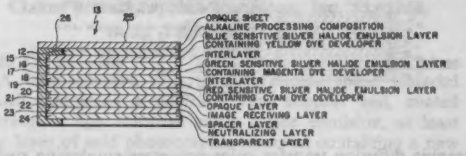
Continuation-in-part of application Ser. No. 815,585, Apr. 14, 1969, which is a continuation-in-part of application Ser. No. 728,538, May 13, 1968. This application May 22, 1970, Ser. No. 39,666

Int. Cl. G03c 1/40, 5/54, 7/00

U.S. Cl. 96—3 36 Claims

The present invention relates to a composite photographic diffusion transfer color process film unit which comprises a photosensitive laminate including a dimensionally stable transparent support carrying a dyeable polymeric layer, a processing composition permeable opaque layer, and a photosensitive silver halide layer having associated therewith a dye transfer image-forming material; a dimensionally stable sheet adapted to be superposed substantially coextensive the surface of the laminate opposite the transparent support, and a container retaining a processing composition adapted to discharge its contents on the surface of the laminate opposite the





transparent support and between the laminate and superposed sheet; and to specified color diffusion transfer processes employing such film unit.

3,594,165

NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

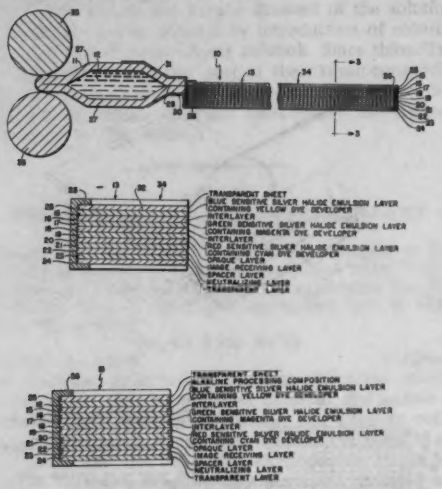
Continuation-in-part of application Ser. No. 815,585, Apr. 14, 1969, which is a continuation-in-part of application Ser. No. 728,535, May 13, 1968. This application May 22, 1970, Ser. No. 39,646

Int. Cl. G03c 1/48, 7/00

U.S. Cl. 96—3 19 Claims

The present invention relates to photography, particularly, to photographic products specifically adapted for employment in specified photographic diffusion transfer color processes and, more particularly, to photographic products which comprise a composite photosensitive structure containing, in combination, a photosensitive laminate including, as essential layers, in sequence, a dimensionally stable layer transparent to actinic radiation; an optional polymeric layer substantially transparent to incident radiation and containing sufficient acidifying capacity to effect reduction of a processing composition having a pH at which a selected dye image-forming material is diffusible to a pH at which such material is substantially non-diffusible; a polymeric layer dyeable by the selected dye image-forming material; a processing composition permeable opaque layer; and a photosensitive silver halide layer having associated therewith a dye image-forming material which is processing composition diffusible, as a function of the point-to-point degree of the silver halide layer's exposure to incident actinic radiation; a transparent dimensionally stable sheet superposed substantially coextensive the surface of the laminate opposite the dimensionally stable transparent layer; and a rupturable container retaining a processing composition containing an opacifying agent positioned extending transverse a leading edge of the film unit to effect unidirectional discharge

of the container's contents intermediate the dimensionally stable sheet and the laminate; and to specified photographic diffusion transfer color processes employing such products.


TRANSPARENT SHEET
BLUE SENSITIVE SILVER HALIDE EMULSION LAYER CONTAINING YELLOW DYE DEVELOPER
INTERLAYER
GREEN SENSITIVE SILVER HALIDE EMULSION LAYER CONTAINING MAGENTA DYE DEVELOPER
INTERLAYER
RED SENSITIVE SILVER HALIDE EMULSION LAYER CONTAINING CYAN DYE DEVELOPER
OPAQUE LAYER
IMAGE RECEIVING LAYER
SPACER LAYER
NEUTRALIZING LAYER
TRANSPARENT LAYER
TRANSPARENT SHEET
ALKALINE PROCESSING COMPOSITION
BLUE SENSITIVE SILVER HALIDE EMULSION LAYER CONTAINING YELLOW DYE DEVELOPER
INTERLAYER
GREEN SENSITIVE SILVER HALIDE EMULSION LAYER CONTAINING MAGENTA DYE DEVELOPER
INTERLAYER
RED SENSITIVE SILVER HALIDE EMULSION LAYER CONTAINING CYAN DYE DEVELOPER
OPAQUE LAYER
IMAGE RECEIVING LAYER
SPACER LAYER
NEUTRALIZING LAYER
TRANSPARENT LAYER

3,594,166
PROCESS FOR PRODUCING COPIES BY IMAGE-WISE HEATING

Alexander Riebel, Leverkusen, and Wolfgang Lassig, Karl Dinges, and Wolfgang Himmelmann, Cologne, Stammheim, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 21, 1965, Ser. No. 515,456
Claims priority, application Germany, Jan. 8, 1965, A 48,075
Int. Cl. G03c *5/04, 11/12, 5/24*
U.S. Cl. 96—27 **6 Claims**

Thermographic copies are made with material, insensitive to daylight, having a support to which is adhered a copying layer of a swellable binder which can be hardened to reduce this swellability. Dispersed in the binder is a hardener that effects such hardening when heated to 50–300° C. and the binder is colored so that it absorbs light and converts the light energy to heat energy. When exposed to an original image with a high intensity flash of at least 300 watt-seconds, the exposed portions of the binder become hardened leaving the other portions swellable. A swelling liquid is then applied and the copying layer placed against a receiving sheet. The swelled unexposed portions of the copying layer adhere to the receiving sheet and when the receiving sheet is pulled away from the copying layer, a relief image of the original is torn out of the copying layer and appears on the receiving sheet. At the same time a relief image of opposite sense remains on the copying layer.

3,594,167
METHOD OF PREPARING HOLOGRAM USING GLASSEOUS RECORDING MEDIUM

Frank P. Laming, North Plainfield, and Arthur D. Pearson, Bernardsville, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Apr. 16, 1968, Ser. No. 721,692
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 **10 Claims**

Certain glassy compositions comprising arsenic, sulfur, and optionally included other elements, make excellent holographic recording media with large multiple storage capabilities and good diffracted powers.

3,594,168
METHOD FOR FABRICATING PHOTOGRAPHIC ARTWORK FOR PRINTED CIRCUITS

Giampiero Compare, Milan, Italy, assignor to General Electric Information Systems S.p.A., Caluso, Turin, Italy

Filed Feb. 12, 1968, Ser. No. 704,658
Claims priority, application Italy, Feb. 13, 1967, 12,554/67
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 **8 Claims**

This invention relates to a method for fabricating photographic artwork for use in the manufacture of printed circuits, the artwork being obtained through the use of a first mask of high precision pattern close to a photosensitive plate and a second mask for opaquing selected portions of the pattern of said first mask and exposing the same to appropriate radiation. This process is repeated until the desired artwork is obtained.

3,594,169
TERTIARY ALIPHATIC PHOSPHINES AS PHOTOGRAPHIC SILVER HALIDE SOLVENTS

Stanley M. Bloom, Waban, and Ronald F. Lambert, Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

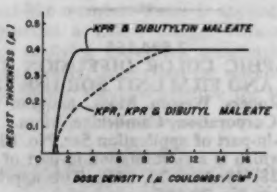
No Drawing. Filed Jan. 21, 1969, Ser. No. 792,776
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 **8 Claims**

Water-soluble tertiary aliphatic phosphines are used as silver halide solvents in photographic processing compositions having a pH in the range of about 4 to 9. In a preferred embodiment, compositions are provided which find particular utility in carrying out diffusion transfer photographic processes at neutrality.

3,594,170
ADDITIVES TO NEGATIVE PHOTORESISTS WHICH INCREASE THE SENSITIVITY THEREOF

Barret Broyde, Highland Park, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 3, 1968, Ser. No. 764,867
Int. Cl. B44d *1/50*; C08f *1/16*
U.S. Cl. 96—36 **35 Claims**



The use of a scanning electron beam to generate a pattern in a negative photoresist is known. Electron beam equipment can be made which is capable of scanning very quickly, but standard negative photoresists require such a large flux of electrons for proper exposure that the scanning equipment must be operated at speeds substantially slower than the capability of the equipment. By adding soluble, heavy organometallic compounds from Groups III–V of the Periodic Table to the photoresist,

the sensitivity or speed of the photoresist is effectively increased. As a result, the electron beam can scan at a higher rate.

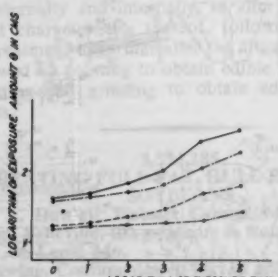
3,594,171
PHOTOGRAPHIC LIGHT SENSITIVE ELEMENTS
Shiro Kimura, Kazuya Sano, and Kazuo Inoue, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
No Drawing. Filed Dec. 22, 1967, Ser. No. 692,707
Claims priority, application Japan, Dec. 22, 1966, 41/84,022
Int. Cl. G03c *1/84*
U.S. Cl. 96—84 **2 Claims**

A photographic light sensitive element comprising a support and at least one layer on said support, one of said layers containing at least one member selected from the group consisting of a photographic filter dye, an anti-irradiation dye and an antihalation dye incorporated in the layer as a solution of the dye in a non-volatile organic solvent which is immiscible with water under the conditions of preparation of said photographic light sensitive element but can be easily dissolved out of said layer under the conditions of processing at a pH higher than 8.5.

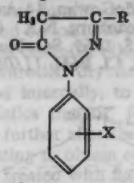
3,594,172
LIGHT DEVELOPABLE, DIRECT-WRITING, SILVER HALIDE EMULSIONS CONTAINING GOLD AND IODINE
Joseph Anthony Sincius, Little Silver, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 588,734, Oct. 24, 1966. This application June 13, 1967, Ser. No. 645,601
Int. Cl. G03c *1/28, 5/32*
U.S. Cl. 96—107 **14 Claims**

Light-developable, direct-writing, radiation-sensitive silver halide emulsions, emulsion layers and elements containing molecular iodine or an iodide ion-yielding compound, a gold salt and optionally a water-soluble bromide and/or plumbous salt, and process for recording images.

3,594,173
LITH-TYPE PHOTOGRAPHIC MATERIAL
Tsuneo Suga, Akio Oshima, and Yuji Kuroda, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Oct. 30, 1968, Ser. No. 771,807
Claims priority, application Japan, Oct. 31, 1967, 42/69,710
Int. Cl. G03c *1/28*
U.S. Cl. 96—108 **3 Claims**



The joint use of certain pyrazolone compounds together with a gold sensitizer is found to be particularly effective to obtain a lith-type silver halide photographic emulsion improved in high-intensity reciprocity failure. The pyrazolone compound has the general formula:



wherein R is an acylamino, arylamino, alkyl, aryl or aralkyl group and X is a hydrogen atom, halogen atom, carboxyl, sulfone, phenoxy amino or nitro group.

3,594,174
NOVEL ANTIFOGGANT FOR SILVER HALIDE EMULSION ON A POLYESTER FILM SUPPORT
Teruhide Haga, Koichi Horigome, Masao Ishihara, and Osakazu Sugino, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
No Drawing. Filed Jan. 29, 1969, Ser. No. 795,034
Claims priority, application Japan, Jan. 31, 1968, 43/5,398
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 **3 Claims**

A light-sensitive silver halide photographic material which comprises a polyester film support and, coated thereon, a light-sensitive silver halide emulsion, at least one layer of said photographic material containing a new antifoggant specified later. The said antifoggant prevents the impurities in the polyester film support from fogging the silver halide emulsion during its storage or incubation.

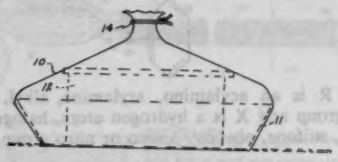
3,594,175
PHOTOSENSITIVE ACETYLENIC POLYMERS
Allan S. Hay, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Continuation-in-part of abandoned application Ser. No. 624,202, Mar. 20, 1967. This application Oct. 1, 1968, Ser. No. 764,287
Int. Cl. G03c *1/68*
U.S. Cl. 96—115 **22 Claims**

Polymeric compositions containing acetylenic groups and a photosensitizing agent, which may be part of the polymer molecule or an additive to the polymer, and which upon absorbing actinic radiation, accelerates the cross-linking of the polymer, are rendered insoluble when exposed to ultraviolet irradiation, thereby making them suitable as photoresists in the graphic arts.

3,594,176
PROTECTION OF FATTY MATERIALS
Leo Morris, Melrose Park, Ill., assignor to CPC International Inc.
No Drawing. Filed Oct. 9, 1967, Ser. No. 673,995
Int. Cl. A23k *1/00*; A23j *1/12*
U.S. Cl. 99—2F **13 Claims**

The present invention is directed to an oxidatively stable free-flowing, non-staining product of high fat content useful both in feed formulations and as a food component and to the process for the preparation thereof. In the process of the present invention, lipids are mixed thoroughly with undried gluten obtained from the commercial wet milling process of corn or grain sorghum. The mixture is then dried to yield a product of high fat content which does not bleed. Suitable lipids for use in the product include soapstocks, vegetable oils or fats, starch fat, animal fat, grease, tallow, and the like. The mixture will contain between 50% and 95% dry basis of the wet gluten and between 50% and 5% dry basis of the lipids. Additional constituents may be added to enhance either the flavor or the food value. Such additives include acids, steepwater, or other suitable additives.

3,594,177
SPECIAL FOOD PACKAGE
Linda E. McGowan, 14 Avenue D, West Keanburg, N.J. 07734
Filed Aug. 5, 1969, Ser. No. 856,875
Int. Cl. B65b *11/00*
U.S. Cl. 99—171R **12 Claims**



A readily closable and re-openable package of food, which may be canned food, refrigerated food or dehydrated food, in which the food is placed within a container which may be a dish, can, cup, etc. and the container is affixed at its bottom surface to a flexible plastic sheet so that the plastic sheet may be gathered about the container and secured with a twisted wire retainer for shipment and handling but when the wire retainer is untwisted, the flexible plastic sheet will fall upon a supporting surface to form a mat that is much larger than the container. This protecting mat makes the feeding container appropriate for feeding dogs or cats as they stand upon the mat thus holding the container from shifting while they feed. It is also helpful for feeding children by providing a pad or cover surrounding the food container to catch the normal spillage in feeding a child. This protecting mat makes the food container ideal for travel and in some instances the mat may have ties for tying it upon the person.

3,594,178
ALKALINE TREATMENT OF HOPS AND RESULTING PRODUCT
Sidney S. Meisler, 3702 Richey Road, Yakima, Wash. 98902
No Drawing. Filed Dec. 26, 1968, Ser. No. 787,193
Int. Cl. C12c *3/00*
U.S. Cl. 99—50 **17 Claims**

A hops product, including the lupulin glands of hops, having improved effectiveness is obtained by subjecting hops material, such as baled dried hops, loose, field dried hops or the separated lupulin glands of hops, to contact with a gaseous or vaporized alkaline-acting treating agent, such as anhydrous ammonia, ammonium hydroxide and/or aqueous sodium hydroxide, subsequently treating the hops material with a gaseous or vaporized agent, such as hydrogen chloride, hydrochloric acid or methyl chloride, and subjecting the resulting treated hops material to a reduced pressure to effect removal of the readily voltalizable materials therefrom.

3,594,179
METHOD OF PRODUCING KVASS WORT CONCENTRATE
Dmitry Amosovich Korolev, Ul. Chkalova 2/5, kv. 23; Ljudmila Sergeevna Salmanova, Ul. Korolenko 1, korpus 3; Valentina Ivanovna Bukanova, Donskaya ul. 28/32, kv. 146; Petr Ivanovich Bukovsky, Gorodok Mossoveta 6, proezd 3, kv. 2; Lidia Semenovna Sheptun, Proletarsky raion, pos. Lenino, ul. Severenaya 10; and Elena Natanovna Chipchina, 9-Ul. Oktyabrskogo polya 7, kv. 50, all of Moscow, U.S.S.R.
No Drawing. Filed Feb. 28, 1967, Ser. No. 619,200
Int. Cl. C12c *7/00*
U.S. Cl. 99—52 **2 Claims**

A process for preparing concentrated kvass wort for cold beverages comprising mashing germinated malt, adding a cytolytic enzyme to a mixture of the mashed malt, flour and water, cytolyzing said mixture, proteolyzing said mixture and evaporating the mixture under vacuum whereby melanoidins are produced directly in the malt.

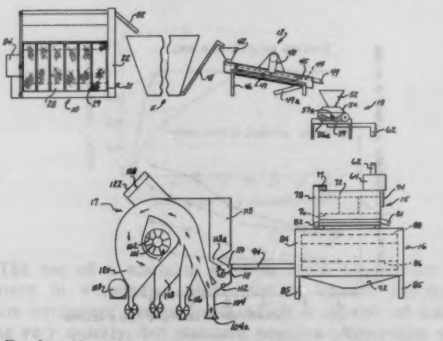
3,594,180
PROCESS FOR MAKING BREAD
Joseph H. Hulse, Rome, Italy, and Robert E. Hannah, Crystal Beach, Ontario, Canada, assignors to Maple Leaf Mills Limited, Research Div., Toronto, Ontario, Canada
No Drawing. Filed June 3, 1968, Ser. No. 733,757
Claims priority, application Canada, June 14, 1967, 993,027
Int. Cl. A21d *2/04, 2/14*
U.S. Cl. 99—90R **5 Claims**

This invention relates to an improved process for making yeast raised bread products which comprises mixing into a standard dough at least one acid selected from lactic acid, acetic acid, acid phosphates, such as calcium phosphate and sodium acid pyrophosphate, acid tartrates, organic acids such as citric acid, tartaric acid, malic acid, adipic acid, fumaric acid, and glucono delta lactone, at least one compound selected from the bromates of sodium, potassium, and calcium, as a first oxidizing agent, and at least one compound selected from the iodates of sodium, potassium and calcium, acetone peroxide, azodicarbonamide, ascorbic acid, dehydro-ascorbic acid, and calcium peroxide, as a second oxidizing agent for a slightly longer than normal mixing time in a conventional dough mixer. The resulting product requires no fermentation and can be immediately divided, moulded, proofed and baked after mixing and resting.

3,594,181
PROCESS OF UTILIZING MUSTARD AND RAPE SEEDS AS DOUGH IMPROVING AGENTS
Albert Alpin, 153 Overdale Road, Bredbury Green, Romiley, near Stockport, Cheshire, England
No Drawing. Filed May 28, 1968, Ser. No. 732,535
Claims priority, application Great Britain, July 19, 1967, 23,556/67
Int. Cl. A21d *2/36*
U.S. Cl. 99—91 **3 Claims**

Comminuted non-toxic plants of the family Cruciferae, Resedaceae, Capparidaceae, or Tropaeolaceae, especially ground white mustard seed, having a valuable improving action, generally similar to that of cysteine, as improvers for wheat flour in the making of bread and like comestibles.

3,594,182
METHOD FOR PROCESSING CHERRY PITS AND RESULTING PRODUCT
George J. Baudhuin, Sturgeon Bay, Wis., assignor to Dorco Manufacturing, Inc.
Filed Jan. 9, 1968, Ser. No. 696,520
Int. Cl. A23b *9/00*
U.S. Cl. 99—93 **7 Claims**



Drying cherry pits and removing any residue of cherry flesh therefrom. Sizing the cherry pits into generally uniform sizes, cracking with controlled pressure so that the portion of the cherry hull adjacent the line of separation is cracked into pieces and the remainder into smaller

pieces, and removing the larger pieces of the cherry hull from the mixture. Grinding a mixture of the cherry kernels and cherry hulls to make an edible flour.

3,594,183

EGG FOOD PRODUCT AND PROCESS FOR THE PREPARATION THEREOF

Daniel Melnick, Teaneck, Marcus I. Wegner, Tenafly, and David R. Davis, Somerville, N.J., assignors to CPC International Inc.

Filed Aug. 31, 1967, Ser. No. 664,674
Int. Cl. A23l *1/10, 1/32*
U.S. Cl. 99—94 **29 Claims**

Egg yolk containing products which are high in polyunsaturates and low in cholesterol content. Egg yolk solids, from which not all but a major part of the fat and cholesterol have been extracted, are mixed with vegetable oil, salt, emulsifiers, and coloring compounds. After this mixture has been emulsified, pasteurized and spray dried, substantially dry, discrete particles of refatted egg yolk solids are recovered. These refatted egg yolk solids may be used as a replacement for conventional egg yolk solids, or when admixed with the proper proportion of egg white solids, used as a replacement for whole egg solids. Further, these refatted egg yolk solids, when combined in the proper proportions with egg white solids, non-fat milk solids, an alkaline material, baking powder, vegetable gum, and sugar and spices, may be cooked after rehydration with water, to yield a scrambled egg or omelet product. Vegetable oil is used for refatting, preferably corn oil, because of its high ratio of polyunsaturates to saturates. The resulting refatted egg yolk product is particularly suitable for consumption by those requiring foods that are low in cholesterol and/or rich in polyunsaturates.

3,594,184

TREATING HULL ENCLOSED COTYLEDON SEEDS

Robert L. Hawley, Webster Groves, Mo., and Jesse T. Duren, Belleville, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 643,781, May 12, 1967. This application Apr. 26, 1968, Ser. No. 724,327
Int. Cl. A23l *1/20*
U.S. Cl. 99—98 **14 Claims**

A method of and products resulting from treating hull enclosed cotyledons, especially pea or bean legumes, particularly soybeans, to remove objectionable flavor, to remove or alter physiologically objectionable sugar constituents, to alter the density and texture to provide a desirable texture, and basically to produce a full-fat edible product retaining the desirable oils, by the use of a special combination of controlled dry heating of the complete bean externally and internally, to alter the internal and external characteristics thereof, followed by controlled water treatment to further alter the altered structure. This is followed by roasting to obtain edible nut like products or roasting and grinding to obtain edible spread type products.

3,594,185

TREATING FULL-FAT, HULL ENCLOSED SOYBEANS

Robert L. Hawley, Webster Groves, Mo., and Jesse T. Duren, Belleville, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 724,327, Apr. 26, 1968, which is a continuation-in-part of application Ser. No. 643.781, May 12, 1967. This application July 18, 1969, Ser. No. 843,208
Int. Cl. A23l *1/20*
U.S. Cl. 99—98 **12 Claims**

A method of and products resulting from treating hull enclosed cotyledons, especially pea and bean legumes, particularly soybeans, to remove objectionable flavor, to remove or alter physiologically objectionable sugar constituents, to alter the density and texture to provide a desirable texture, and basically to produce a full-fat edible product retaining the desirable oils, by the use of a special combination of controlled dry heating of the complete bean externally and internally, to alter the internal and external characteristics thereof, followed by controlled water treatment to further alter the altered structure. This is followed by roasting to obtain edible nut-like products. The beans may be treated with flavor material, sugars or oils to obtain different edible nut-like products having desirable flavor and texture. Also the beans may be subjected to roasting and grinding to obtain edible spread type products.

3,594,186

PRODUCING A FULL-FAT FLOUR PRODUCT FROM COTYLEDON SEED MATERIALS

Robert L. Hawley, Webster Groves, Mo., and Jesse T. Duren, Belleville, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 637,910, May 12, 1967. This application Apr. 26, 1968, Ser. No. 724,326
Int. Cl. A23l *1/20*
U.S. Cl. 99—99 **15 Claims**

A method of making full-fat flour products from hull enclosed cotyledons, especially pea or bean legumes, particularly soybeans, utilizing a novel sequence of steps to dehull and also to alter the texture and cell structure in a manner causing the treatment steps to remove objectionable flavor constituents, to remove or alter physiologically objectionable sugar constituents, and basically to produce a full-fat edible flour product retaining the desirable oils, by the use of a special combination of controlled dry heating of the complete bean externally and internally, to alter the internal and external chemical and physical characteristics thereof, followed by controlled water treatment to further alter the heat altered structure by swelling and extraction processes. This is followed by either (a) drying the treated cotyledons and grinding to a powder, or (b) grinding the treated cotyledons, slurrying with water, and flash drying to a powder.

3,594,187

POTATO PRODUCTS HAVING IMPROVED FLAVOR

Alexander L. Liepa, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Mar. 27, 1968, Ser. No. 716,296
Int. Cl. A23l *1/12;* **A23b** *7/02*
U.S. Cl. 99—100 **8 Claims**

A process for improving the flavor of cooked potato products prepared from dehydrated potatoes and water. A flavor-enhancing agent derived from a plant of the Cruciferae family is added to the potatoes prior to cooking to provide an enhanced natural potato flavor in the cooked product.

3,594,188

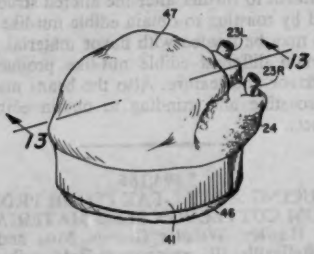
PREPARATION OF FROZEN PAR-FRIED POTATOES

Charles C. Huxsoll, San Pablo, and Merle L. Weaver, Martinez, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 2, 1969, Ser. No. 812,857
Int. Cl. A23l *1/00;* **B65b** *55/16*
U.S. Cl. 99—100P **2 Claims**

Conventional frozen par-fried potatoes when prepared for the table rapidly lose their crispness and become limp and soggy. This problem is cured as described herein by applying a treatment with radiant heat before the potato strips are subjeced to the usual par-frying operation.

3,594,189
PARTIALLY BONED POULTRY PRODUCT AND METHOD OF PREPARING SAME
Carlo Panattoni, San Francisco, Calif., assignor to San Francisco Poultry, Inc., doing business as American Poultry Company, San Francisco, Calif.
Filed Nov. 13, 1967, Ser. No. 682,300
Int. Cl. A22c *21/00*
U.S. Cl. 99—107 5 Claims

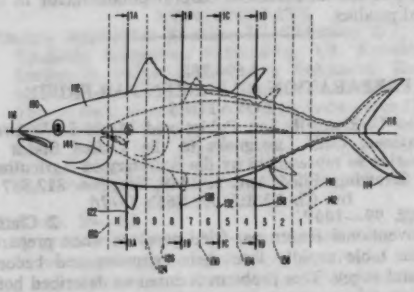


A single portion of partially boned poultry product is formed by filleting a double chicken breast to which the first joints of the wings remain attached and wrapping the meat around a ball of dressing. The product simulates a miniature whole roast chicken, the wing stubs simulating the drumsticks and the breast meat the chicken carcass.

3,594,190
RECOVERY OF ADHERING MEAT FROM BONES
Michael J. Eslinger, Weston, Ontario, John E. Dicks, Bolton, Ontario, and Henry R. Nordin, Maple, Ontario, Canada, assignors to Canada Packers Limited, Toronto, Ontario, Canada
No Drawing. Filed Oct. 20, 1967, Ser. No. 676,718
Int. Cl. A22c *11/00, 17/04*
U.S. Cl. 99—109 8 Claims

This invention relates to a process for recovering adhering meat from raw bones which the major portion of the meat has already been removed. The process comprises tumbling the bones in a rotating drum in the presence of water or salt brine to abrade the meat from the bones by the combined action of the liquid and of the bones falling and rubbing repeatedly upon themselves to form a meat slurry, and then drawing off the slurry from the cleaned bones. The slurry is used directly in sausage manufacture where it imparts good binding power and adds food value.

3,594,191
METHOD OF PROCESSING TUNA
James M. Lapeyre, 13 Richmond Place, New Orleans, La. 70115
Filed Feb. 14, 1969, Ser. No. 799,403
Int. Cl. A22c *25/00, 25/18*
U.S. Cl. 99—111 30 Claims



Method of processing tuna for a canned pack thereof including the preliminary subdivision of whole frozen tuna transverse to the longitudinal backbone thereof into a plurality of lateral sections of substantially uniform thickness followed by selective grading of similarly sized and configured sections thereof to facilitate subsequent processing thereon.

3,594,192
PROCESS FOR MAKING SOY PROTEIN MORE HEAT COAGULABLE IN COMBINATION WITH EGG WHITE AND COMPOSITIONS CONTAINING SAME
Joseph D. Mullen, Golden Valley, Donald E. Smith, Minneapolis, and Alide Ogrins, St. Paul, Minn., assignors to General Mills, Inc.
No Drawing. Filed Nov. 29, 1967, Ser. No. 686,726
Int. Cl. A23j *3/02*
U.S. Cl. 99—114 16 Claims

Aqueous dispersions of soy protein material are modified by raising the pH to over about 9.0 and then reducing the pH to about 5.5 to 8.0. The modified products are used to replace a portion of the egg white in foods whose structures depend at least in part on the heat coagulation properties of egg white.

3,594,193
POWDERED ICE CREAM MIX
Abraham R. Mishkin, Marysville, Donald E. Yingst, Columbus, and Joseph J. Peters, Marysville, Ohio, assignors to Société d'Assistance Technique Pour Produits Nestlé S.A.
No Drawing. Filed May 20, 1968, Ser. No. 730,625
Int. Cl. A23g *5/00*
U.S. Cl. 99—136 4 Claims

Preparing a powdered non-dairy ice cream mix by forming a premix of fat, sugar, corn syrup, sodium caseinate, and emulsifier homogenizing and spray drying the premix and subsequently blending the premix with additional sweetener, fat, emulsifier and a flavoring. The emulsifier employed is a combination of sorbitan tristearate and sorbitan monooleate.

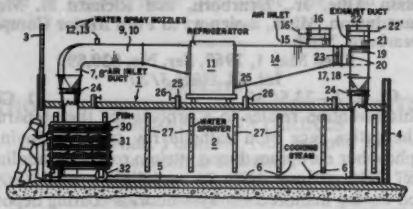
3,594,194
PROCESS FOR TREATMENT OF BASIL AND PRODUCTS THEREOF
Angelo Ricci, 2790 24th St., San Francisco, Calif. 94110
Filed May 18, 1970, Ser. No. 38,116
Int. Cl. A23l *1/22, 1/26*
U.S. Cl. 99—140 15 Claims

Process for assuring the retention of the natural green color and flavor of basil leaves which includes heating the leaves by steam or hot water, quenching the leaves in cold water, and cutting the leaves into small particles which will remain in suspension when the basil particles are blended with other ingredients to form a flavoring sauce.

3,594,195
COMPOSITIONS CONTAINING 2-VINYLPYROMECONIC ACID AS A FLAVOR AND AROMA ENHANCER
Bryce E. Tate, Ninantic, and Robert P. Allingham, Groton, Conn., assignors to Pfizer Inc.
No Drawing. Division of application Ser. No. 591,126 Nov. 1, 1966, now Patent No. 3,468,916, dated Sept. 23, 1969, and continuation-in-part of application Ser. No. 310,141, Sept. 19, 1963. This application Apr. 10, 1969, Ser. No. 834,923
Int. Cl. A23l *1/22*; C11b *9/00*
U.S. Cl. 99—140 2 Claims

Enchancing the flavor and aroma of edibles and the aroma of perfumes by adding 2-vinylpyromeconic acid.

3,594,196
MULTIPURPOSE COOKER METHOD
Ernest W. Peterson, Los Alamitos, Calif., assignor to Ralston Purina Company, St. Louis, Mo.
Filed Dec. 11, 1967, Ser. No. 689,556
Int. Cl. A23b *3/00, 3/06*
U.S. Cl. 99—158 4 Claims



A method of preparing tuna for canning which prevents surface dehydration and retards enzymatic and oxidative deterioration of the fish from the time of evisceration through precooking and cooling. The method utilizes a chamber having suitable means for refrigerated holding, precooking and cooling of fish. After the fish are eviscerated, they are placed in the chamber under refrigerated conditions to retard deterioration and to attain a uniform temperature throughout the fish. The fish are then subjected to the precooking operation which due to the initial uniform temperature of the fish results in a uniform processing of the fish. After the fish are precooked, they are cooled either by recirculating water saturated refrigerated air through the chamber or by initially utilizing evaporative cooling and thereafter recirculating water saturated refrigerated air through the chamber to cool the fish to a desired temperature.

3,594,197
PROCESS AND COMPOSITION FOR IMMERSION PLATING OF ALUMINUM OR ALUMINUM ALLOYS WITH TIN
Stanley Bunevich, Houston, and Richard E. Horn, Pittsburgh, Pa., assignors to Pitt Metals Company, Pittsburgh, Pa.
No Drawing. Filed Oct. 29, 1968, Ser. No. 771,650
Int. Cl. C23c *3/00*
U.S. Cl. 106—1 9 Claims

A process for the immersion plating of aluminum and aluminum alloys with tin and the composition of the bath. The plating bath comprises an aqueous mixture of an alkali metal stannate and boric acid, or an alkali metal borate or mixtures thereof. The boric acid or alkali metal borate prevents precipitation of metastannic acid and allows the immersion tin plating bath to be operated under unusual pH conditions. The reaction products stabilize the bath and cause the bath to be self-regulating. The boric acid or alkali metal borate forms a complex with the alkali metal stannates in the plating bath.

3,594,198
PHOTOTROPIC GLASS
Lowell L. Sperry, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Continuation-in-part of application Ser. No. 708,426, Feb. 26, 1968, which is a continuation-in-part of application Ser. No. 537,682, Mar. 28, 1966, which in turn is a continuation-in-part of application Ser. No. 236,716, Nov. 9, 1962, all now abandoned. This application Apr. 9, 1970, Ser. No. 27,166
Int. Cl. C03c *3/14, 3/08, 3/26*
U.S. Cl. 106—54 7 Claims

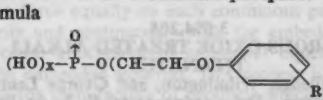
The present invention relates to phototropic glass and to processes for producing a phototropic glass. A phototropic glass is one which has the ability to color or darken in color when radiated with light of a particular wave length region and whose induced color fades rapidly, that is, within a few minutes after the exciting radiation is removed. The present invention particularly relates to glasses which exhibit a phototropic effect when radiated with ultraviolet light or sunlight. The invention especially relates to phototropic potassium borate glasses comprising a glass body having in at least a portion thereof microcrystals of at least one silver halide such as silver chloride, silver bromide, or silver iodide or mixtures thereof.

3,594,199
METHOD OF MAKING IMPROVED FIRED BASIC REFRACTORY BRICK AND PRODUCT
Walter S. Treffner, Linthicum Heights, and George D. MacKenzie, Baltimore, Md., assignors to General Refractories Company, Philadelphia, Pa.
No Drawing. Filed Sept. 13, 1968, Ser. No. 759,772
Int. Cl. C04b *35/42*
U.S. Cl. 106—59 22 Claims

An improved fired basic refractory brick is provided by firing a shaped body consisting essentially of an intimate mixture of, A, a pre-reacted mixture of periclase and chrome ore wherein periclase particles are sintered directly to chrome ore particles and, B, a small amount of fine, substantially pure chromic oxide (Cr_2O_3).

3,594,200
TEXTILE YARN FINISH
Leigh W. Cooley, Greenville, and Neil Lamar Finch, Kinston, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of abandoned application Ser. No. 583,111, Sept. 29, 1966. This application Nov. 28, 1967, Ser. No. 686,320
Int. Cl. C08h
U.S. Cl. 106—245 1 Claim

A textile finish composition consisting essentially of a glyceryl triester, a salt of a sulfated glyceryl triester, a wax and a salt of an aromatized phosphate ester having the formula



wherein *n* is a number from 1 to 10, R is hydrogen or an alkyl radical of up to 12 carbon atoms and X is one or two.

3,594,201
ASPHALT EMULSIONS
Harry L. Sommer, Lafayette, and Charles C. Evans, Orinda, Calif., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Apr. 29, 1968, Ser. No. 725,187
Int. Cl. C08h *13/00;* C08k *1/62;* C09d *3/24*
U.S. Cl. 106—277 5 Claims

Time stabilized, corrosion resistant anionic asphalt emulsions comprise a mixture consisting of 50 to 75% by weight asphalt and 25 to 50% by weight aqueous phase. The aqueous phase contains from 20 to 80 grams per liter of an emulgator containing specified amounts of ammonia or diammonium phosphate.

3,594,202
ASPHALTIC COMPOSITIONS
Luke W. Corbett, Mountainside, and Robert E. Swarbrick, Belle Mead, N.J., assignors to Esso Research and Engineering Company
No Drawing. Filed May 17, 1966, Ser. No. 550,644
Int. Cl. C08h *13/00, 17/22*
U.S. Cl. 106—278 13 Claims

Asphaltic compositions comprising admixtures of asphaltenes and high boiling ester plasticizers, e.g., diisodecyl phthalates, have the unusual combination of properties including excellent temperature susceptibility, high viscosity and good resistance to aging and hardening.

3,594,203
VISCOSITY STABILIZED CLAY SLURRIES
Edgar W. Sawyer, Jr., Edison, and Walter L. Haden, Jr., Metuchen, N.J., Louis L. Petty, Irwinton, Ga., and Barry S. Miller, Roselle, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Woodbridge, N.J.
Filed Nov. 19, 1968, Ser. No. 777,105
Int. Cl. C09c 1/42
U.S. Cl. 106—288B 7 Claims

A high solids slurry of a kaolin clay coating pigment obtained by the flotation of colored impurities from sedimentary Georgia kaolin clay is deflocculated and the viscosity of the deflocculated slurry is adjusted to a minimum value with tetrasodium pyrophosphate. A small amount of an organic polyanionic polymer is incorporated in the slurry as a stabilizer. The quantity of organic polymer is such that the viscosity of the freshly prepared slurry is substantially unchanged by its presence.

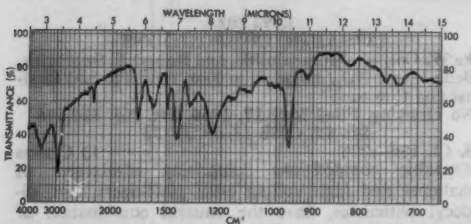
3,594,204
USE OF CLAY IN SYSTEMS CONTAINING VINYL MONOMERS
John C. Nease, Piscataway, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.
No Drawing. Application Sept. 8, 1967, Ser. No. 666,491, now Patent No. 3,450,666, dated June 17, 1969, which is a continuation-in-part of application Ser. No. 457,176, May 19, 1965. Divided and this application Apr. 4, 1969, Ser. No. 842,039
Int. Cl. C09c 1/00
U.S. Cl. 106—288B 6 Claims

A small amount of a polyoxyethylene fatty acid ester is coated on a dry clay filler having surface acidity. When incorporated with an ethylenically unsaturated monomer, undesired polymerization of the monomer by the clay is prevented.

3,594,205
HYDROUS OXIDE TREATED ALKALI TITANATES
Hugh C. Gulledge, Wilmington, and George Leotasacos Lewis, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 411,692, Nov. 17, 1964, now Patent No. 3,380,847. This application Apr. 29, 1968, Ser. No. 725,149
Int. Cl. C09c 1/00, 1/36
U.S. Cl. 106—299 2 Claims

A fibrous alkali titanate in intimate association with from 0.1 to 25% by weight based on the weight of the fibrous titanate, of precipitated alumina, titania or zirconia has particular utility as a pigment in paper manufacture and as an insulating composition.

3,594,206
LATEX RECOATING PROCESS
Alex A. Scarborough, La Grange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed June 4, 1968, Ser. No. 734,363
Int. Cl. B44d 1/16
U.S. Cl. 117—2 12 Claims

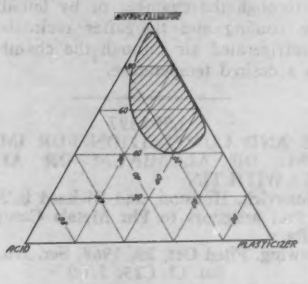


Latex-backed fabrics can be effectively recoated with latex by first applying to the original, glazed latex backing a precoating composition comprising acrylonitrile-conjugated diene copolymer, a curable condensation resin and a solvent.

3,594,207
CATHODE RAY TUBE MANUFACTURE
William Allie, Jr., Dearborn, and Richard H. Marsh, Farmington, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed May 1, 1969, Ser. No. 820,899
Int. Cl. H01j 3/20
U.S. Cl. 117—33.5CM 1 Claim

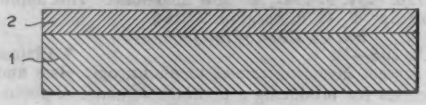
This invention relates to a process for the preparation of the active face of a cathode ray tube employing as the phosphor europium doped yttrium oxide or gadolinium oxide. The yttrium oxide or gadolinium oxide is protected during manufacture by a fluoride coating deposited from a buffered suspension.

3,594,208
HEAT SENSITIVE COLOR PROJECTION TRANSPARENCY BLANK AND METHOD OF MAKING
Joseph A. Wiese, Jr., St. Paul, John R. Berg, Roseville, and Donald J. Williams, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed June 16, 1969, Ser. No. 833,642
Int. Cl. B41m 5/18
U.S. Cl. 117—36.8 7 Claims



An integral film for making long-lived color projection transparencies by thermographic copying techniques comprises a first coating of a color progenitor in a vinyl halide resin binder and a firmly retained heat-resistant and permanently clear and transparent second coating of an acidic reactant in a plasticized nitrocellulose binder.

3,594,209
INK TRANSFER MATERIAL AND METHOD FOR MANUFACTURE THEREOF
Horst H. Kosche and Ferdinand K. Müller, Duren, and Karl-Heinz Meyer, Kreuzau, Germany, assignors to Renker-Belipa G.m.b.H., Duren, Germany
Filed May 27, 1968, Ser. No. 732,246
Claims priority, application Austria, May 26, 1967, A 4,906/67
Int. Cl. B41m 5/10
U.S. Cl. 117—36.1 13 Claims



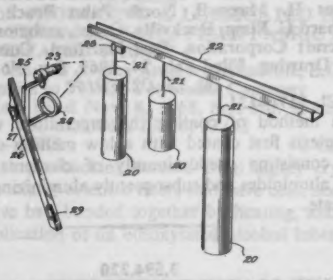
Ink transfer material is produced by heating a mixture of at least a hard and a soft wax in a non-polar or

weakly polar organic liquid along with a high molecular weight binding agent. The solution is agitated and cooled below 25° C. to separate out 40% to 70% of the wax as gel particles and after pigment material is added the dispersion/solution mixture is applied to a carrier having at least surface absorbency. The liquid is expelled to produce a carbon paper for single use with greater blackening.

3,594,210
METHOD OF CONTROLLING RESIN DEPOSITION ON ABSORBENT MATERIALS
Arthur Drelich, Plainfield, N.J. assignor to Johnson & Johnson
No Drawing. Filed Apr. 17, 1969, Ser. No. 817,177
Int. Cl. B44d *1/092, 5/00*
U.S. Cl. 117—38 **12 Claims**

A method of controlling resin deposition on absorbent materials by treating the absorbent material with certain polyelectrolyte compounds and applying an emulsion polymerized resin to the treated material. The product obtained by the method is also disclosed.

3,594,211
AUTOMATIC COATING SYSTEM
Edward W. Drum, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corporation
Filed Oct. 20, 1966, Ser. No. 588,181
Int. Cl. B05c *1/16, 3/20*
U.S. Cl. 117—43 **4 Claims**

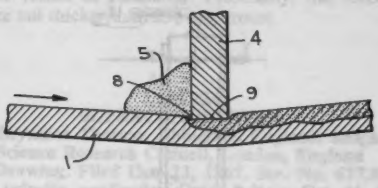


Methods of coating irregularly shaped articles and of shading the edges of articles are performed automatically using a sensor that moves with the coating apparatus to generate a control signal for the coating apparatus. Where the sensitive area of the sensing means is not co-extensive with the coating zone of the coating apparatus, the control signal is stored in a memory means synchronized with the coating apparatus. The recorded signal is detected to operate the coating apparatus over the appropriate portion of its path of movement when the article to be coated is within the coating zone of the coating apparatus.

3,594,212
TREATMENT OF FIBROUS MATERIALS WITH MONTMORILLONITE CLAYS AND POLYAMINES AND POLYQUATERNARY AMMONIUM COMPOUNDS
Le Roy T. Ditsch, Minneapolis, Minn., assignor to General Mills, Inc.
No Drawing. Filed Mar. 25, 1968, Ser. No. 715,542
Int. Cl. B44d *1/44;* **C08h** *17/06*
U.S. Cl. 117—62 **17 Claims**

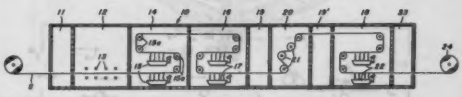
Cotton fibrous materials are treated with an alkali metal or acid montmorillonite clay and with a polyamine or polyquaternary ammonium compound. The treatments can be repeated yielding products of increased softness. Some of such products have increased clay retention and various of the products can be further treated with functional anionic or cationic organic compounds such as germicides, dyes and so forth.

3,594,213
PROCESS FOR CONTROLLING POROSITY IN FIBROUS WEBS
Joseph T. Rudman, 10—51 Bay 25th St., Far Rockaway, N.Y. 11691
Filed Oct. 27, 1967, Ser. No. 678,708
Int. Cl. B44d *1/44*
U.S. Cl. 117—65.2 **12 Claims**



A process for controlling porosity in fibrous webs. The process includes a combination of steps comprising imparting movement to a fibrous web so as to present a moving surface, depositing a substantially liquid material on the moving surface, embedding the liquefied material into continuous portions of the moving surface, and applying a force equally on each continuous portion simultaneously and continuously with the embedding step so as to cause attachment of additional liquefied material with the embedded material. This process is particularly adapted for manufacture of products which are useful in filtering gases, chemicals, and liquids. Waterproof fabrics having air and water-vapor permeability may also be produced according to the process.

3,594,214
METHOD OF APPLYING A ZINC COATING TO A SHEET-STEEL BASE
Lawrence E. Helwig, Hampton Township, and Michael V. Murray, Monroeville Borough, Pa., assignors to United States Steel Corporation
Continuation-in-part of abandoned application Ser. No. 561,807, June 30, 1966. This application Apr. 4, 1969, Ser. No. 822,805
Int. Cl. C23c *13/02*
U.S. Cl. 117—71 **1 Claim**



Low-carbon steel strip is continuously coated with a thin layer of iron by vapor deposition while at a temperature of at least 350° F. under an atmospheric pressure of not more than 10^{-4} torr. The iron-coated strip is then subjected to a flash coating of zinc by vapor deposition under similar conditions. The strip is then cooled, to

remove the heat adsorbed by condensation of metal vapor thereon, and a further coating of zinc applied thereto by any desired method conveniently under the same or increased atmospheric pressure, the total thickness of zinc applied being limited to less than .001".

3,594,215

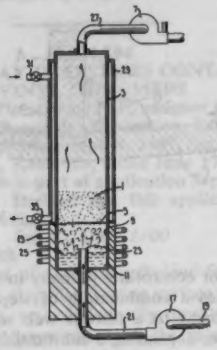
COATING OF GRANULAR PARTICLES

Gene F. Wakefield, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of application Ser. No. 522,769, Jan. 24, 1966. This application Sept. 10, 1968, Ser. No. 758,795

Int. Cl. C23c *13/04*

U.S. Cl. 117—100 **6 Claims**



Disclosed is a method and apparatus for coating particulate material with metals utilizing a fluidized bed. The invention comprises a jacketed fluidizing chamber evacuated by a vacuum pump and containing particles to be coated, a cell containing the coating metal, and heating coils for heating the metal. The process enables metallic coatings to be placed on heat sensitive substrate particles, since the fluidizing chamber is easily cooled by the combined effects of circulating a cooling fluid through the jacket and maintaining a vacuum in the chamber.

3,594,216

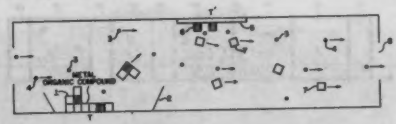
VAPOR PHASE DEPOSITION OF METAL FROM A METAL-ORGANIC BETA-KETOAMINE CHELATE

Robert G. Charles, Allison Park, and James G. Cleary, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 19, 1969, Ser. No. 834,642

Int. Cl. C23c *11/02*

U.S. Cl. 117—107.2 **6 Claims**



A metallic coating is deposited on a substrate by heating the substrate and contacting the substrate with vaporized metal-organic beta-ketoamine chelates, which react on contact with the hot substrate surface in a gaseous atmosphere to deposit the metal coatings.

3,594,217

BINDER FOR THIN LAYER CHROMATOGRAPHIC ADSORBENTS

Earl K. Seybert, Towson, and Philip W. Link, Baltimore, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed May 21, 1968, Ser. No. 730,934

Int. Cl. C03c *17/22, 17/00*

U.S. Cl. 117—119.6 **9 Claims**

Improved plates for thin layer chromatography are prepared by incorporating alkali metal silicates into the adsorbent layer. The presence of the silicate binder serves to prevent cracking, crazing, or separation of the adsorbent from the substrate.

3,594,218

WATER AND OIL REPELLENT ARTICLES

Elemer Domba, Olympia Fields, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 732,505, May 28, 1968, which is a continuation-in-part of application Ser. No. 494,872, May 28, 1965, both now abandoned. This application Aug. 6, 1969, Ser. No. 848,121

Int. Cl. D06m *15/16*

U.S. Cl. 117—139.5 **2 Claims**

New and useful ethylenically unsaturated fluorinated polymers can be used to make articles and fabrics water and oil repellent.

3,594,219

PROCESS OF FORMING ALUMINIDE COATINGS ON NICKEL AND COBALT BASE SUPERALLOYS

Douglas H. Maxwell, North Palm Beach, Fla., and Richard C. Elam, Rockville, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

No Drawing. Filed Feb. 24, 1969, Ser. No. 801,839

Int. Cl. C23c *9/00*

U.S. Cl. 117—131 **5 Claims**

The method of coating the superalloys wherein the substrate is first coated with a low melting eutectic-type alloy consisting predominantly of elements that form stable aluminides and subsequently aluminizing the coated substrate.

3,594,220

BLUSH COATED FABRIC AND METHOD FOR PRODUCING THE SAME

Frederick H. Schwacke, Jr., Farmingdale, N.Y., John L. Egitto, Belleville, N.J., Charles A. Kumins, Chappaqua, N.Y., and Robert S. Hansen, Ames, Iowa, assignors to Inmont Corporation, New York, N.Y.

No Drawing. Continuation of application Ser. No. 464,578, June 16, 1965. This application May 14, 1969, Ser. No. 828,422

Int. Cl. D06n *3/00*

U.S. Cl. 117—135.5 **28 Claims**

The invention is a leather-like sheet material and a method of making it, wherein a cast film of a blushable polyurethane coating is dried by evaporation of the volatile components. The dried film, which is microporous, may be used as an unsupported film by stripping from a temporay support, or it may be used attached to a permanent support such as a textile fabric.

3,594,221

PROCESS OF TREATING FIBROUS MATERIALS

William S. Baldwin, Minneapolis, Minn., assignor to General Mills, Inc.

No Drawing. Filed Mar. 25, 1968, Ser. No. 715,577

Int. Cl. A61l *13/00; C08h 17/06*

U.S. Cl. 117—138.5 **7 Claims**

Fibrous materials such as cotton cloth are treated with an acid or alkali metal montmorillonite clay and then

with a cationic germicide to render the same resistant to bacterial action for extended periods of time.

3,594,222

LITHIUM CHLORIDE AS ANTISTATIC AGENT IN RUBBER LATEX COMPOSITION AND USE OF SAID LATEX

William Earl Wells, Hogansville, Ga., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed May 15, 1968, Ser. No. 729,441
Int. Cl. C09k 3/16
U.S. Cl. 117—138.8 8 Claims

There is dissolved the use in rubber latex of lithium chloride dissolved in the aqueous phase of rubber latex so as to impart antistatic characteristics to the deposit formed on drying the latex. The amount of lithium chloride preferably equals from 1 to 15% by weight of total solids in the latex composition. There is also disclosed the use of this latex in conjunction with any article of manufacture to dissipate any charge of static electricity that might otherwise build up therein. Thus it can be used in the manufacture of carpets for example as an adhesive to secure the tufts which form the face of the carpet to the backing material such as the primary jute backing. The normal propensity of such carpet to build up a charge of static electricity is thus greatly reduced.

3,594,223

PROCESS OF PRODUCING A LUBRICATED HEAT BONDED THERMOPLASTIC FIBER FABRIC AND THE LUBRICATED FABRIC

Ralph H. Via and Arthur Kramer, Greenville, S.C., assignors to Phillips Petroleum Company

No Drawing. Filed Nov. 8, 1968, Ser. No. 774,526
Int. Cl. D06m 13/16, 13/52
U.S. Cl. 117—138.8 8 Claims

Improved carpet backing formed from highly crystalline and molecularly oriented fibers that have been needled into a cohesive bat, bonded together by heating, and followed by application of an ethoxylated alcohol lubricant.

3,594,224

CELLULOSIC FIBERS IMPREGNATED WITH A QUATERNARY SALT OF A TERTIARY AMINE

Peter Blackman, Cranston, R.I., assignor to I.C.I./Organics/Inc.

No Drawing. Division of application Ser. No. 577,774, Sept. 7, 1966, now Patent No. 3,492,324, which is a continuation of application Ser. No. 276,069, Apr. 26, 1963. This application July 25, 1969, Ser. No. 855,442
Int. Cl. D06m 13/40
U.S. Cl. 117—139.5 11 Claims

A cellulosic fiber impregnated with a compound having the formula

$$(R_1CONH-(CH_2)_n-\underset{\displaystyle R_2}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-(CH_2)_n-NHCOR_1)_x$$

wherein R_1CO is a fatty acid radical, R_2 is selected from the group consisting of hydrogen, alkyl, hydroxy alkylene, alkaryl and aryl, x is a radical selected from the group consisting of sulfate, halide and aliphatic acid radicals and n is 2–6. Methods of impregnating cellosic fibers with the indicated compounds and methods of preparing these compounds are also disclosed.

3,594,225

THIN-FILM RESISTORS

Robert K. Waits, Palo Alto, Calif., assignor to Fairchild Camera and Instruments Corporation, Syosset, N.Y.

Original application Sept. 21, 1967, Ser. No. 669,424, now Patent No. 3,458,847, dated July 29, 1969. Divided and this application Oct. 30, 1968, Ser. No. 801,886
Int. Cl. B44d 1/18
U.S. Cl. 117—212 10 Claims

An insulating underlayer is formed over a portion of an insulating substrate to create two surfaces wherein the microstructure variations of one surface are substantially different from the microstructure variations of the other. One or more resistive films are then formed over a portion of the underlayer surface and one or more other resistive films are formed over a portion of the substrate surface, whereby the deposited films may have the same geometry and composition of material, but will have substantially different values of resistance. Preferably, the resistance films are not thicker than 250 angstroms.

3,594,226

SUPERCONDUCTORS

David Brynmor Thomas, Abingdon, England, assignor to Science Research Council, London, England

No Drawing. Filed Oct. 23, 1967, Ser. No. 677,025
Claims priority, application Great Britain, Oct. 31, 1966, 48,777/66
Int. Cl. B44d 1/18
U.S. Cl. 117—228 2 Claims

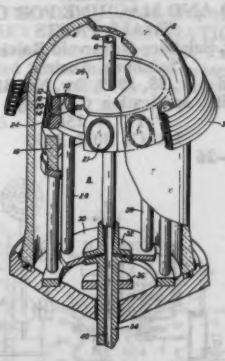
A superconducting cable consists of multiple strands of carbon fibre coated with a superconductor. The strands may be woven to form a tube and the tube encapsulated to form a rigid coil capable of carrying a cryogenic fluid.

3,594,227

METHOD FOR TREATING SEMICONDUCTOR SLICES WITH GASES

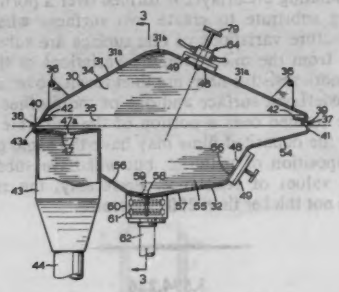
Donald R. Oswald, Schnecksville, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 12, 1968, Ser. No. 744,415
Int. Cl. C23c 11/06, 11/00
U.S. Cl. 117—229 7 Claims



Process for deposition of epitaxial and dielectric films is disclosed. Molybdenum discs for holding semiconductor slices are mounted for rotational movement in a near-vertical plane and for translation along a locus of points substantially equidistant from a heat source. The discs in one embodiment are rested against the inclined sides of a rotating frustoconical housing with their edges in contact with a horizontal track. A deposition chamber enveloping the apparatus provides downward gas flow. Outside RF coils encircle the chamber.

3,594,228
COLOURING OF SHEATHED CONTINUOUS STRANDS
Donald John Mock, Chateauguay, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed Aug. 1, 1967, Ser. No. 657,607
Int. Cl. B44d *1/08*
U.S. Cl. 117—231 10 Claims

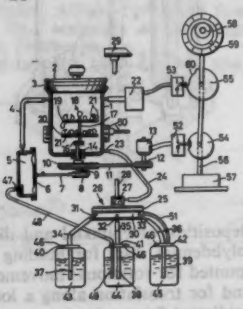


A method for the surface colouring of an absorbent sheath on a continuous strand in which the strand is passed, with the sheath being wet, longitudinally through a zone of atomized liquid dye.

3,594,229
PLATED SUBSTRATE AND RELATED METHODS
John H. Kefalas, Waltham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.
No Drawing. Filed June 29, 1966, Ser. No. 561,341
Int. Cl. H01f *10/02*; B44d *1/14*; B32b *15/16*
U.S. Cl. 117—237 15 Claims

A metallic film deposited on a sensitized and seeded thin gel coating on a non-metallic substrate adheres firmly to the substrate. The process requires no intermediate or final curing and the resultant article has high stability against degradation in many solvents including water.

3,594,230
METHOD AND MACHINE FOR CLEANING SMALL PARTS
Hans Kierner, Salzburg-Oesterreid Bajeenammerstrasse, Salzburg, Austria
Filed Apr. 25, 1969, Ser. No. 819,161
Claims priority, application Germany, Apr. 26, 1968, P 17 71 256.0
Int. Cl. B08b *3/00*
U.S. Cl. 134—26 3 Claims

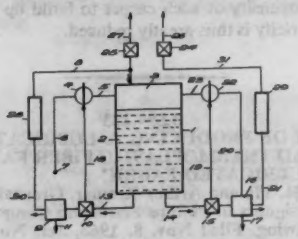


A method and means for cleaning small parts wherein there is utilized or provided pumps, control valves, rinsing liquid and a cleansing liquid, and a vacuum arrangement.

3,594,231
BATTERY WITH POLY(AZOBISFORMAMIDES) DEPOLARIZER
Charlotte Marie Kraebel, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed July 23, 1969, Ser. No. 844,208
Int. Cl. H01m *15/06*
U.S. Cl. 136—6 4 Claims

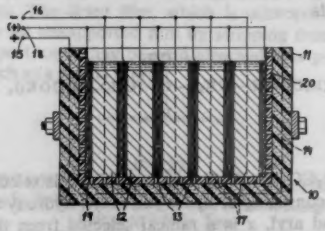
Poly(biureas) are formed by the reaction of polyisocyanates with semicarbazides, and by other syntheses. The poly(biureas), which are polyhydrazo compounds, are readily reversibly oxidized to the corresponding azo compounds. The oxidation-reduction reaction of the hydrazo-azo moieties act as depolarizing reaction for primary and secondary battery cells, particularly zinc-carbon cells.

3,594,232
DEVICE FOR THE AUTOMATIC ADJUSTMENT OF THE SUPPLY OF LIQUIDS
Dieter Spahrbier, Frankfurt am Main, Germany, assignor to Varta Aktiengesellschaft, Frankfurt am Main, Germany
Filed July 12, 1968, Ser. No. 744,357
Claims priority, application Germany, July 19, 1967, V 34,103; Mar. 13, 1968, P 16 67 346.4
Int. Cl. B01j *7/02*; F04f *1/14*; H01m *27/14*
U.S. Cl. 136—86C 18 Claims



The supply of liquid, which may be catalytically decomposed with the evolution of gas, to a main decomposing catalyst body, is regulated by the pressure of gas generated from such liquid on an auxiliary catalyst body. The main catalyst body may be in a gas diffusion electrode.

3,594,233
RECHARGEABLE GAS-POLARIZED CELL
Allen Charkey, Flushing, and Frederick P. Kober, Bayside, N.Y., assignors to Yardney International Corporation, New York, N.Y.
Filed July 19, 1968, Ser. No. 746,153
Int. Cl. H01r *29/04*
U.S. Cl. 136—86 2 Claims



Cell with an external gas electrode enclosing a plurality of reversible metal electrodes, the latter electrodes being

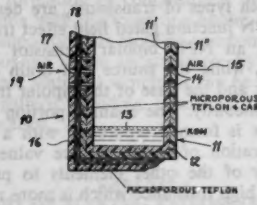
separated from one another and from the gas electrode by inert conductor screens serving as auxiliary recharging electrodes; the auxiliary electrode or electrodes proximal to the gas electrode may be separated therefrom by a permeable inert dielectric spacer storing a reserve quantity of liquid electrolyte.

3,594,234

AIR DEPOLARIZED FUEL CELL

Maurice Lang, Massapequa, N.Y., and Renato Di Pasquale, Paramus, N.J., assignors to Yardney International Corporation, New York, N.Y.

Filed Aug. 23, 1968, Ser. No. 754,797
Int. Cl. H01m *29/04*
U.S. Cl. 136—86 **16 Claims**



An air-depolarized fuel cell with a metal electrode in a gas-permeable envelope electrode of microporous carbon-Teflon mixture, containing an alkaline electrolyte, is surrounded by a shell of microporous Teflon closely spaced from the envelope electrode by a small clearance designed to receive products of interaction of carbon dioxide with the electrolyte.

3,594,235

METHOD OF USING A METAL-AIR CELL WITH A TETRA-ALKYL-SUBSTITUTED AMMONIUM ELECTROLYTE

Paul J. Moran, Ballston Lake, N.Y., assignor to General Electric Company

Filed Aug. 30, 1968, Ser. No. 756,507
Int. Cl. H01m *29/04*
U.S. Cl. 136—86 **1 Claim**

A method of generating electrical energy from a metal-air cell includes providing at least one gas diffusion cathode, supplying an oxygen oxidant to the cathode, providing at least one anode, and providing for the cathode and anode an aqueous electrolyte selected from the class consisting of tetra-alkyl-substituted ammonium hydroxides and tetra-alkyl-substituted ammonium halides. The electrolyte eliminates or substantially reduces the accumulation of carbonate reaction products which are formed from the reaction of carbon dioxide from the air with some other alkaline electrolytes.

3,594,236

METHOD FOR PREPARING AN AIR BREATHING ELECTRODE

David P. Boden, Yardley, Pa., and Jack C. Sklarchuk, Trenton, N.J., assignors to ESB Incorporated

No Drawing. Filed Nov. 22, 1967, Ser. No. 684,935
Int. Cl. H01m *27/04*
U.S. Cl. 136—120 **10 Claims**

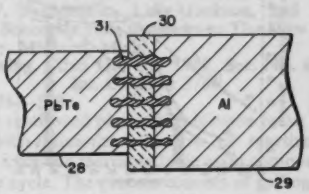
A method for preparing an air breathing electrode which comprises applying a catalyst composition to a metallic grid member, applying a fluorocarbon polymer sheet material containing a poreforming agent onto one side of the catalyst composition and thereafter removing the pore-former from the fluorocarbon polymer sheet material to render it microporous. The fluorocarbon polymer sheet material is applied to the catalyst composition by hot pressing to firmly attach it thereto. The metallic salt pore-former is removed from the fluorocarbon polymer sheet material after it is applied to the catalyst composition, and the pore-former may be removed by contacting the electrode with a leaching solvent. An alternative procedure comprises applying a layer of a catalyst composition onto a fluorocarbon polymer sheet material containing a pore former, placing a metallic grid onto the catalyst layer, hot pressing the grid/catalyst/fluorocarbon polymer to form a unitary structure, and then removing the pore-former.

3,594,237

THERMOELECTRIC DEVICE INCLUDING TUNGSTEN GRANULES FOR OBTAINING LOW RESISTANCE BONDS

George Sonnenschein, Los Angeles, Calif., assignor to North American Rockwell Corporation

Original application Oct. 28, 1963, Ser. No. 319,301, now Patent No. 3,392,439, dated July 16, 1968. Divided and this application Sept. 27, 1967, Ser. No. 680,284
Int. Cl. H01v *1/04*
U.S. Cl. 136—227 **4 Claims**



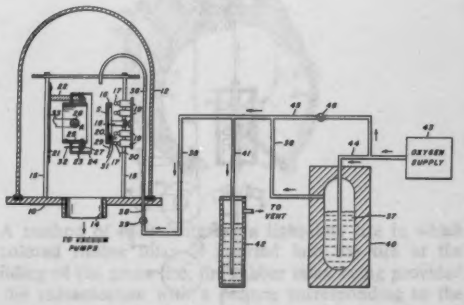
A thermoelectric device for generating electric current including a telluride thermoelectric body bonded to a conductive body of material. A barrier layer is disposed between the two bodies, and conductive tungsten granules penetrate this barrier layer to bond together the two bodies and form low-resistance conductive paths between them through the barrier layer.

3,594,238

METHOD FOR TREATING ALUMINUM SURFACES TO PREVENT DISCOLORATION

Ralph E. Hoeckelman, Manor Borough, Pa., assignor to United States Steel Corporation

Filed Aug. 15, 1968, Ser. No. 752,933
Int. Cl. C23f *7/06*
U.S. Cl. 148—6.3 **5 Claims**



A method and apparatus for treating an aluminum surface to prevent discoloration of the surface when exposed

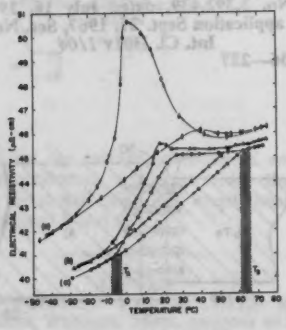
to boiling water. Particularly applicable to a steel substrate which has a corrosion-resistant aluminum coating. The aluminum surface is exposed to an atmosphere of vapors of a volatile silicon compound and oxygen in a gaseous plasma. A thin protective film of mixed oxides of silicon and aluminum forms on the surface.

3,594,239

METHOD OF TREATING UNIQUE MARTENSITIC ALLOYS

Frederick E. Wang, Taipei, Taiwan, assignor to the United States of America as represented by the Secretary of the Navy

Filed Feb. 26, 1968, Ser. No. 708,300
Int. Cl. C21c *1/26*; C22f *1/16*
U.S. Cl. 148—13 6 Claims



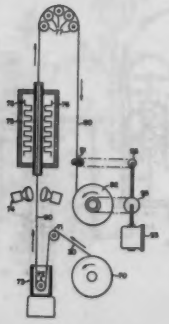
A method of stabilizing an alloy from the class consisting of TiNi, TiCo, TiFe, $TiNi_xCo_{1-x}$ and $TiCo_xFe_{1-x}$ by annealing it at 650° to 700° C. and cooling it slowly to a temperature at which the alloy does not undergo thermal cycling.

3,594,240

PROCESS OF MAKING GLASS COATED ELECTRICAL STEEL CORES

Karl Foster and Joseph Seidel, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Application Sept. 2, 1966, Ser. No. 576,963, now Patent No. 3,528,863, dated Sept. 15, 1970, which is a continuation-in-part of application Ser. No. 556,337, June 9, 1966. Divided and this application June 15, 1970, Ser. No. 46,375
Int. Cl. H01f *3/02*
U.S. Cl. 148—113 1 Claim



An oriented silicon steel product and method for producing the same is described in which improved magnetostriction and strain sensitivity are obtained by means of bonding a thin glass layer to the surface of the steel.

3,594,241

MONOLITHIC INTEGRATED CIRCUIT INCLUDING FIELD EFFECT TRANSISTORS AND BIPOLAR TRANSISTORS, AND METHOD OF MAKING

Heber J. Bresee, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 11, 1968, Ser. No. 697,055
Int. Cl. H01l *7/34*
U.S. Cl. 148—175 13 Claims

A monolithic integrated circuit including a plurality of field effect transistors and bipolar transistors formed in a single epitaxial layer on the same semiconductor member and a method for doing so with diffusion steps common to both types of transistors, are described. The top gate of a PN junction gated field effect transistor and the emitter of an NPN bipolar transistor are formed simultaneously, while the source and drain of the field effect transistor and the base of the bipolar transistor are formed simultaneously. The channel portion of the field effect transistor is formed separately with a doping impurity concentration of lower surface value and lower slope than any of the other elements to provide such channel with a high resistance which is more uniform and easier to reproduce.

3,594,242

METHOD FOR PRODUCTION OF EPITAXIAL FILMS

John W. Burd, Chesterfield, and Warren O. Groves, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Original application Jan. 3, 1966, Ser. No. 521,240, now Patent No. 3,441,000, dated Apr. 29, 1969. Divided and this application Sept. 26, 1968, Ser. No. 798,225
Int. Cl. H01l *7/36*; C23c *13/00*; B05c *11/14*
U.S. Cl. 148—175 7 Claims

The method of producing semiconductor materials by the epitaxial deposition of a film on a substrate by introducing an epitaxial reaction gas mixture into a first zone and thereafter passing the gas mixture into an isothermal zone at an initially high velocity between 5×10^2 centimeters per second and the sonic velocity of the gas. As a result thereof, rapid mixing and agitation of the gas in the isothermal zone prevent non-uniform deposition of the film on a substrate in the isothermal zone.

3,594,243

FORMATION OF POLYMERIC RESISTS

Albert S. Deutsch, Vestal, and William G. Herrick, Binghamton, N.Y., assignors to General Aniline & Film Corporation, New York, N.Y.

No Drawing. Filed Feb. 7, 1967, Ser. No. 614,412
Int. Cl. B23p *15/00*; B24b *1/00*; C23f *1/00*
U.S. Cl. 156—13 14 Claims

Polymeric resist-image formation involving the irradiation of a maleic anhydride polymer coating with cor-

puscular radiation, e.g., an electron beam, whereby to insolubilize the exposed areas, resist-image formation being effected by solvent treatment of the polymer coating.

3,594,244
METHOD OF MAKING AN EMBOSSING STRUCTURE

John Mackinnon, Edison, N.J., Jose A. Rionda, Beverley Hills, Jamaica, and Herbert F. Schroeder, South Plainfield, N.J., assignors to Esso Research and Engineering Company

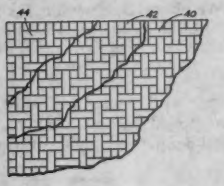
Filed May 22, 1967, Ser. No. 640,273
Int. Cl. B29j *5/00*
U.S. Cl. 156—62.2 7 Claims

The present invention relates to the art of producing embossing platens or plates from parenchyma, a waste portion of bagasse. It contemplates the extraction or removal of parenchyma from the fibrous portions of the bagasse, the formation of compositions by admixture of the parenchyma with thermosetting binder resins, and the use of the compositions as molding compounds for formation of embossing plates or structures by hot stamping methods. These plates or structures can be produced with any desired pattern including, especially, those providing wood grain effects.

3,594,245
METHOD OF MAKING EMBOSSED PANEL

Jack R. Hayes, Crescent City, Calif., assignor to Hambro Forest Products, Inc., Crescent City, Calif.

Filed July 17, 1967, Ser. No. 653,826
Int. Cl. B29j *5/04*
U.S. Cl. 156—62.2 2 Claims



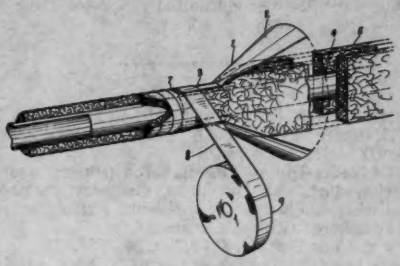
A panel having a plastic film as an overlay over a dense base layer of particle board, with an embossed pattern borne by the base layer and the overlay, manufactured by the steps of preparing a mat of loosely organized, bondable particle material, placing a plastic film over this mat, and with an embossing plate having a pattern in relief carried over one face, pressing the plastic film against the mat, simultaneously with the application of heat, to consolidate the film and the particle material in the mat into an integral panel product, with the pattern on the face of said plate transferred in tactile form through the overlay to the dense base layer.

3,594,246
METHOD OF CONTINUOUSLY APPLYING INSULATION TO LENGTHS OF TUBING

Karl Arne Arovelius, Vasteras, Sweden, assignor to Aktiebolaget Svenska Metallverken, Vasteras, Sweden

Continuation of application Ser. No. 584,450, Oct. 5, 1966. This application Jan. 12, 1970, Ser. No. 1,964
Claims priority, application Sweden, Oct. 11, 1965, 13,151/65
Int. Cl. B31c *13/00*; B65h *81/08*
U.S. Cl. 156—162 7 Claims

A method and apparatus for wrapping tape or the like in overlapping coils about an insulated pipe or tube wherein the insulated tube is passed through a funnel-like die having a straight outlet extension integral therewith, and the tape is wound partly on the outer end of the outlet exension and partly on the portion of the pipe just leaving



said outlet, so that the coils of tape lie in overlapping relationship.

3,594,247
FILAMENT WINDING PROCESS

Donald W. Pennington, Lake Jackson, and Floyd E. Norton, Brazoria, Tex., assignors to The Dow Chemical Company, Midland, Mich.

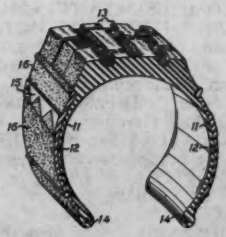
No Drawing. Filed Oct. 30, 1967, Ser. No. 679,194
Int. Cl. B31c *3/00*
U.S. Cl. 156—175 8 Claims

Filament reinforced plastic pipe is made by an improved process which minimizes the loss of reactive, volatile monomers from the thermosettable resin composition during the cure cycle. The process consists of gelling the resin by subjecting the resin-filament layer to a temperature sufficient to gell the resin within 5 minutes and then curing the resin at the normal curing temperature.

3,594,248
METHOD OF MANUFACTURING TIRES HAVING AN ANNULAR PATTERNED COLORED BAND ON THE TIRE SIDEWALL

Nils Cronje Sjoberg, Trelleborg, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag, Trelleborg, Sweden

Filed Mar. 18, 1968, Ser. No. 713,797
Claims priority, application Sweden, Mar. 23, 1967, 4,099/67
Int. Cl. B29h *21/02*
U.S. Cl. 156—116 3 Claims



A method of manufacturing a light-duty tire in which a colored rubber inlay is inserted into the tire at the building of the green tire, the rubber inlay being provided at the vulcanization with a pattern corresponding to the desired tire sidewall decoration in the form of elevated portions with steep sides, whereupon the entire free surface of the rubber inlay after vulcanization and removal of the tire from the vulcanizing mold is coated with

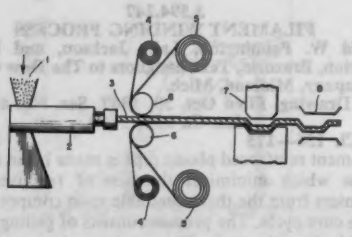
a self-vulcanizing rubber solution of substantially the same color as the remaining portions of the tire, and finally, after self-vulcanization of the rubber solution, the desired tire sidewall decoration is made visible by grinding away the self-vulcanized rubber on the elevated portions of the pattern.

3,594,249

PRODUCTION OF NONPLANE BUILDING COMPONENTS COMPOSED OF THERMOPLASTIC AND METAL LAYERS

Heinz Mueller-Tamm, Ludwigshafen (Rhine), and Hans Frielingsdorf, Bad Durkheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 11, 1968, Ser. No. 759,018
Claims priority, application Germany, Sept. 14, 1967, P 17 04 496.1
Int. Cl. B31f *1/00*
U.S. Cl. 156—199 6 Claims



A process for the production of nonplane building components which comprise a relatively thick inner ply of the thermoplastic and relatively thin outer plies of metal. The building components are prepared by continuously preparing a board from a polyethylene by means of a screw extruder at elevated temperature, covering the board thus obtained on both sides first with a film of a special terpolymer and then with a metal sheet at elevated temperature, forming a sandwich assembly from the whole under the pressure of rollers and then bringing the plane board into the desired nonplane shape at elevated temperature using external forces.

3,594,250

PRODUCTION OF PLANE BUILDING COMPONENTS COMPRISING A THERMOPLASTIC INNERLAYER WITH METAL OUTER PLIES

Heinz Mueller-Tamm and Dieter Mahling, Ludwigshafen (Rhine), Hans Frielingsdorf, Bad Duerkheim, and Alfred Hofmann, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 6, 1968, Ser. No. 757,923
Claims priority, application Germany, Sept. 8, 1967, P 17 04 494.9
Int. Cl. B29c *19/00*
U.S. Cl. 156—244 7 Claims

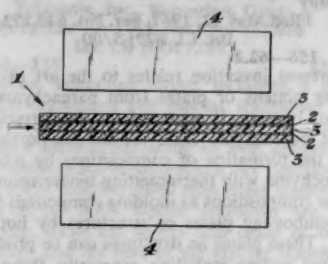
A process for the production of plane building components which are composed of a relatively thick inner ply of a thermoplastic and relatively thin outer plies of metal. In the process a board is first made continuously from a polyethylene by means of a screw extruder at elevated temperature, then this board is coated on both sides by means of a pair of rollers continuously with a film of a special terpolymer and thereafter with a sheet of metal. The whole is made into a sandwich assembly by the pressure of the rollers and then brought to ambient temperature.

3,594,251

PROCESS FOR PRODUCING FLEXIBLE FOAM CUSHIONING

Robert E. Erickson and David P. Sheetz, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 10, 1968, Ser. No. 743,591
Int. Cl. B29c *27/04*
U.S. Cl. 156—273 11 Claims



Thick slabs of latex foams requiring substantially shorter drying periods are prepared by (1) layering in sandwich fashion thin cured slabs of latex foam coated at each slab interface with a latex adhesive and (2) curing the adhesive line at each interface by dielectric heat.

3,594,252

TELEBLOCK POLYMER BACKING FOR TILE AS SUBSTRATE OVERLAY MATERIAL

Betty B. Weinberg, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed May 27, 1968, Ser. No. 732,097
Int. Cl. B32b *31/14*
U.S. Cl. 156—297 10 Claims

Tile is bonded to a backing of teleblock polymer and said article is applied as an attractive, waterproof, insulated, sound deadening, resilient substrate overlay.

3,594,253

BONDING CARBON TO STEEL

Robert W. Froberg, Walter G. Krellner, and Dolores A. Moore, St. Marys, Pa., assignors to Stackpole Carbon Company, St. Marys, Pa.

Filed May 15, 1968, Ser. No. 729,255
Int. Cl. C09j *1/00*
U.S. Cl. 156—325 4 Claims

Steel and carbon members are bonded together by a cement formed in situ between the members by reaction of orthophosphoric acid and an oxygen-containing compound of cadmium or of silver or an oxygen compound of both boron and zinc. In the preferred embodiment the cement has dispersed through it finely divided silica. The bonds between the two members remain desirably strong at elevated temperatures.

3,594,254

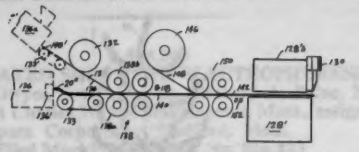
AUTOMATIC MANUFACTURING APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of application Ser. No. 703,523, Dec. 18, 1957, which is a continuation-in-part of application Ser. No. 559,232, Jan. 16, 1956. This application Aug. 31, 1964, Ser. No. 393,292
Int. Cl. B29b; B44f *1/10*
U.S. Cl. 156—384 15 Claims

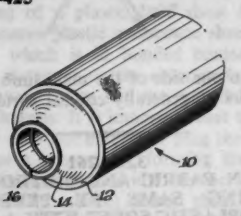
An apparatus for the automatic and continuous production of composite sheet material comprising first and

second extruding means for extruding synthetic resinous material, automatic printing means, laminating means and



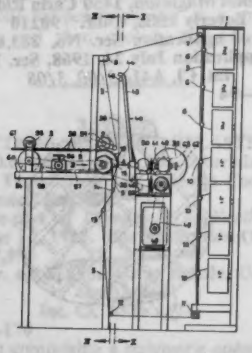
means for deforming predetermined lengths of the laminated material.

3,594,255
HICKEY ROLLER AND METHOD
William D. Budinger, Wilmington, Del.
(Rte. 1, Box 469D, Chadds Ford, Pa. 19317)
Filed Oct. 16, 1968, Ser. No. 767,980
Int. Cl. B31c *13/00*; B65h *81/00*; B41f *35/04*
U.S. Cl. 156—425 12 Claims



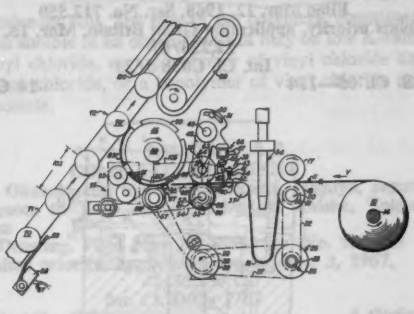
A very effective and long-lived hickey roller has a smooth roll surface of compressed felted fibers with a denier less than 3, bonded together by binder, with at least the outer portion of the surface porous to printing ink. Smooth character can be provided by helically wrapping a relatively narrow sheet of the felted fibers around a roll core and cementing it in place under pressure with the helical edges carefully butted together. Alternatively a sheet sufficiently wide can be circularly wrapped several times around the core, cemented in place and then ground to a uniform cylindrical surface. Raising of a little nap on the surface is helpful.

3,594,256
APPARATUS FOR PRODUCING A WARP BY CLOSED LOOPS
Wolfgang Schuller and Heinz Keib, Wertheim (Main), and Gunter Wiegand, Hasloch, Unterfranken, Germany, assignors to Werner Hugo Wilhelm Schuller, Munich-Grunwald, Germany
Filed Apr. 18, 1968, Ser. No. 725,254
Claims priority, application Germany, Apr. 22, 1967, G 49,895
Int. Cl. B65h *81/08*
U.S. Cl. 156—440 13 Claims



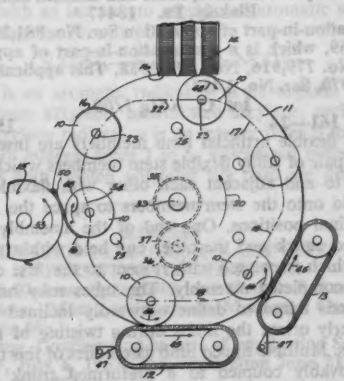
Warp threads, ropes, or bands consisting of glass fibers are transported over the center portion of a rotary drum which has circular rows of radial pins at the ends. A rotary thread laying arm lays closed loops of a cross thread, rope, or band consisting of glass fibers, over pairs of pins of the rows so that transverse closed loop cross the warp threads on one side and can be bonded to the same.

3,594,257
APPARATUS FOR APPLYING LABELS TO ARTICLES
George W. von Hofe, Millington, N.J., assignor to New Jersey Machine Corporation, Hoboken, N.J.
Filed June 22, 1967, Ser. No. 648,101
Int. Cl. B65c *9/04*
U.S. Cl. 156—455 8 Claims



This invention is concerned with the combination of a first means for successively gripping the terminal labels in a continuous web of labels and applying such labels to the articles, and a second means for hindering the labels adjacent to the terminal labels from partaking of the advancing movement of the latter as they are being applied so that the terminal labels are successively separated from such adjacent labels by the force used by the first means in applying them to the articles.

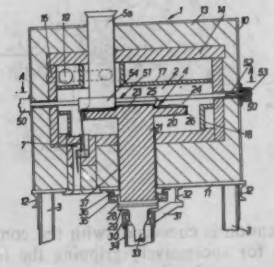
3,594,258
LABELING MACHINE
Karl Dullinger, Neutraubling, Germany, assignor to Hermann Kronseder, Neutraubling, Germany
Filed Feb. 28, 1969, Ser. No. 803,143
Claims priority, application Germany, Mar. 6, 1968, P 16 11 910.1
Int. Cl. B65c *9/08*; B65h *1/06*
U.S. Cl. 156—570 10 Claims



A labeling machine having components such as a label magazine, labeling cylinder, and gluing mechanism clustered about the generally circular orbit of a series of label

transfer shoes mounted on a rotating shoe carrier. Mechanism is provided to shape the orbit of the shoes to conform with the surface configuration of the said components for improved cooperation between the shoes and the components. Mechanism is also provided for rotating the shoes about their own axes in the proper direction and at the proper speed for label transfer purposes.

3,594,259
CONTINUOUS HEAT TREATMENT OF GLASS-FORMING MATERIALS
Ernesto Coen, Liverpool, John Victor Alderson, Southport, and Robert Smith, Ormskirk, England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England
Filed Mar. 12, 1968, Ser. No. 712,559
Claims priority, application Great Britain, Mar. 15, 1967, 12,233/67
Int. Cl. C03b *5/26*
U.S. Cl. 65—134 **14 Claims**

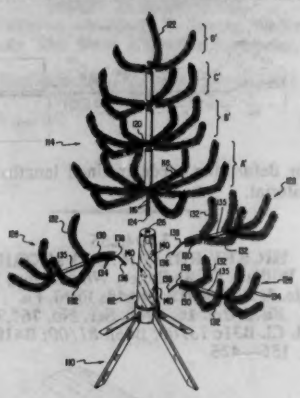


Molten glass is produced by continuously distributing glass-forming materials onto a moving (e.g. a rotating) hearth, exposing the materials to high temperature while the materials remain stationary relative to the hearth and are moved by the hearth through a furnace chamber to convert the materials into molten glass, and directing the molten glass over an edge of the hearth as a continuous stream.

3,594,260
ARTIFICIAL SHRUBBERY AND METHOD OF MANUFACTURING THE SAME
Percy Dieffenbach, Main and Lincoln Sts., Blakely, Pa. 18447
Continuation-in-part of application Ser. No. 881,803, Dec. 3, 1969, which is a continuation-in-part of application Ser. No. 779,916, Nov. 29, 1968. This application Jan. 16, 1970, Ser. No. 3,414
Int. Cl. A41g *1/00*
U.S. Cl. 161—24 **15 Claims**

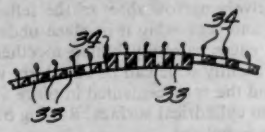
Stiffly flexible artificial limb members are inserted between a pair of stiffly flexible stem members which extend parallel to and adjacent each other with flexible spacer tubes slid onto the stem members to space the limbs at longitudinal positions. One end of the assembly is held in a fixed chuck and the other end held within a second chuck which is rotated with respect to the first chuck to form a completed assembly. The tubes may have their upper ends flared to define outwardly inclined surfaces to properly orient the limbs during twisting of the stem members. Multiple tipped limb assemblies of this type may be removably coupled to a preformed trunk member carrying a plurality of radial holes for receiving the same.

Alternatively, each multiple tip limb assembly may be provided with a hooked end at the top which is removably coupled to the preformed trunk such that the main limb portion extends downwardly and outwardly therefrom, of the trunk with the cross limbs directed radially out-



wardly and to one side of the main limb to form frustoconical sectors of generally conical shrubbery assembly.

3,594,261
NONWOVEN FABRIC AND METHOD OF MANUFACTURING SAME BY PERFORATING A THERMOPLASTIC SHEET WITH A LASER BEAM
Arthur B. Broerman, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Nov. 22, 1968, Ser. No. 778,190
Int. Cl. B23k *9/00*; B29b *17/08*; B32b *3/10*
U.S. Cl. 161—62 **12 Claims**



A light absorbing thermoplastic sheet may be converted into a nonwoven textured fabric by directing a pulsed laser beam onto each area of a predetermined pattern of minute closely-spaced areas over the surface of the sheet with sufficient intensity to cause the sheet to melt and be perforated in each such area. While the area is molten, a stream of air or other gas may be directed into the area with sufficient force and duration to fibrillate or otherwise form the molten material therein.

3,594,262
SHEET MATERIAL
Herbert Magidson, 1450 Carla Ridge, Beverly Hills, Calif. 90210
Continuation of application Ser. No. 283,800, May 28, 1963. This application July 24, 1968, Ser. No. 749,906
Int. Cl. A41c *3/00, 3/08*
U.S. Cl. 161—94 **1 Claim**

A three-dimensional article, such as a brassiere cup, having an elastically stretched fabric held in the desired

shape by a grid shaped stiffener injection molded to one side thereof.

3,594,263
LAMINATED SHEET FOR ELECTROPHORESIS
James L. Dwyer, South Lincoln, Richard A. Paine, Bedford, and Charles W. Souza, Pinehurst, Mass., assignors to Millipore Corporation, Bedford, Mass.
Filed Mar. 27, 1967, Ser. No. 626,323
Int. Cl. B01d *13/02*; B32b *5/18*
U.S. Cl. 161—160 6 Claims

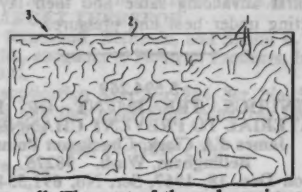
This invention provides a laminated sheet for electrophoresis consisting of a plastic base sheet to which is bonded a microporous plastic membrane sheet consisting largely of pores which is in bonded contact with the plastic base with the pores on the outer surface open for receiving electrolyte solution and the material to be analyzed by electrophoresis. It is important that the adhesive bonding material does not enter and plug the pores. The invention provides a process for forming the laminated sheet, which comprises adhesively connecting together the base sheet and the porous plastic sheet under such control of pressure and temperature that the porosity of the sheet is no impaired.

3,594,264
ULTRAVIOLET LIGHT STABILIZED POLYCARBONATE ARTICLE
Raymond C. Urban, Pittsfield, Mass., assignor to General Electric Company
No Drawing. Filed Oct. 28, 1968, Ser. No. 771,336
Int. Cl. B32b *27/18, 27/30*
U.S. Cl. 161—165 6 Claims

An ultraviolet light resistant polycarbonate article consisting of a polycarbonate substrate having bonded to at least one surface thereof an acrylate copolymer film of 1 to 10 mils thickness wherein the acrylate copolymer film has uniformly dispersed throughout 0.25–5.0 weight percent of an ultraviolet light absorbent based on the weight of the acrylate copolymer film. The ultraviolet light absorbent may be any of the known ultraviolet light absorbents. The article is particularly resistant to ultraviolet light and protects the polycarbonate from attack from ultraviolet light. In addition, a process is also disclosed for preparing an ultraviolet light resistant polycarbonate article, which process consists of bringing an acrylate copolymer film into contact with a polycarbonate sheet at elevated temperatures and at a pressure of at least 20 p.s.i. and then cooling the article to room temperature.

3,594,265
MANUFACTURE OF THERMOPLASTIC SHEET
George L. Wicker and Malcolm Tate, Rochdale, England, assignors to Turner Brothers Asbestos Company, Limited, Manchester, England
Continuation-in-part of abandoned application Ser. No. 463,009, June 10, 1965. This application Oct. 24, 1967, Ser. No. 677,695
Claims priority, application Great Britain, Oct. 26, 1966, 48,101/66
Int. Cl. B32b *5/16*
U.S. Cl. 161—170 8 Claims

A rigid sheet comprising a polymeric constituent which is wholly or predominantly vinyl chloride homopolymer or is formed from monomers in which vinyl chloride predominates with fibre reinforcement is prepared by forming a dough-like mass of the polymeric constituent in the form of a solution or in the form of a mixture of a solution and a dispersion in water with the fibre, and building up the mass in very thin laminations on



a hot calender roll. The part of the polymeric constituent which is soluble in an organic solvent may be low K-value polyvinyl chloride, or a copolymer of vinyl chloride and vinylidene chloride, or a copolymer of vinyl chloride and vinyl acetate.

3,594,266
COMPOSITE FILAMENT
Kaoru Okazaki and Yoichi Shimokawa, Nagoya, Japan, assignors to Toyo Rayon Kabushiki Kaisha, Tokyo, Japan
No Drawing. Filed May 21, 1968, Ser. No. 730,923
Claims priority, application Japan, June 3, 1967, 42/35,150
Int. Cl. D02g *3/02*
U.S. Cl. 161—173 6 Claims

Composite polyamide filament having improved antistatic properties, wherein one of the components is composed of synthetic polyamides, and another composed of a polymer blend of a polyamide and a block-copolyetheramide. The block-copolyetheramide comprises 15 to 85%, preferably about 20 to 60% by weight of polyether segments, which segments should present in an amount of 0.1 to 10%, preferably about 0.3 to 5% by weight based on the composite filament. It is advantageous that each of the polyether segments contains about 45 to 130 ether oxygen atoms.

3,594,267
REINFORCING PROCESS
David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
No Drawing. Filed Sept. 22, 1969, Ser. No. 860,017
Int. Cl. B32b *27/40*; C09j *3/12, 5/02*
U.S. Cl. 161—231 5 Claims

The adhesion of fibrous polyester reinforcing material to rubber stock can be improved by treating the fibrous material with an isocyanato substituted aromatic sulfonyl azide having the formula

$$(N_3O_2S)_x—A—[(R)_y—NCO]_z$$

where A is an aromatic radical, R is an organic radical selected from alkylene, unsaturated alkylene, cycloalkylene and arylene radicals, y is an integer from 0 to 1 and x and z are integers from 1 to 5. Vulcanized rubber tires reinforced with treated polyester tire cord are disclosed.

3,594,268
IMPREGNATED CELLULOSIC LAMINATES AND INTERMEDIATES THEREFOR
Ronald H. Dahms, Springfield, and George J. Anderson, Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 651,387, July 6, 1967. This application June 21, 1968, Ser. No. 738,782
Int. Cl. B32b *27/10*
U.S. Cl. 161—250 9 Claims

Impregnated cellulosic sheets and laminates which are cold punchable and have good electrical properties. Such

constructions are prepared from cellulosic substrates impregnated with a mixture of carboxylated alkadiene interpolymer and a low molecular weight phenolformaldehyde resin and then over treated with a certain higher molecular weight substituted phenol-formaldehyde resin. Laminates are made from the resulting sheet-like members by first advancing same and then laying up and thermosetting under heat and pressure.

3,594,269

CONTINUOUS TREATMENT OF FIBROUS MATERIAL TO PREVENT CHANNELING

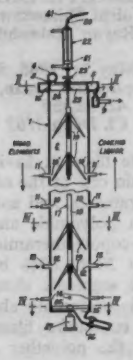
James d'A Clark, Chuckanut Point, Bellingham, Wash. 98225

Application Dec. 18, 1967, Ser. No. 691,554, which is a continuation-in-part of application Ser. No. 368,917, May 20, 1964. This application July 16, 1969, Ser. No. 842,245

The portion of the term of the patent subsequent to Sept. 16, 1986, has been disclaimed and dedicated to the Public

Int. Cl. D21c *3/26*

U.S. Cl. 162—17 7 Claims



An apparatus and process for the treatment of fibrous material with treating liquids in which use is made of an elongate passage with means for introducing a fibrous material into one end portion of the passage and introduction of treating liquid into an intermediate portion of the passage with means for draining treating liquid from the one end portion of the passage and removing treated fibrous material from the other end portion of the passage and including a reciprocating pusher mounted in the passage for reciprocal axial movement with pusher arms inclined in the direction away from the one end of the passage to effect endwise displacement of the fibrous material in the same direction therewith during movement in the direction away from the one end portion of the passage and particularly for disturbing the fibrous material along a greater portion of the passage for redistribution in the passage during return movement without substantial axial displacement of the fibrous material therewith thereby to permit effecting a substantially uniform countercurrent flow through the passage between the fibrous material and treating liquid and which includes means for introducing wash water into the passage beyond the region for introduction of treating liquid whereby the wash water engages the fibrous material subsequent to contact with the treating liquid to leach treating liquid from the fibrous material before removal from the passage and which may include the introduction of steam into the passage beyond the region for introduction of the treating liquid but before introduction of the wash water to raise the wash water to elevated temperature while in contact with the treated fibrous material.

3,594,270

UPGRADING UNBLEACHED SULFITE PULPS

Walter C. Schattner, Webster, and Frank L. Wells, Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 702,545, Feb. 2, 1968. This application Mar. 24, 1970, Ser. No. 22,370

Int. Cl. D21c *3/06*

U.S. Cl. 162—80 5 Claims

Unbleached sulfite wood pulps can be upgraded to "esterification grade" via processes having excellent yields, which processes comprise the essential step of treating the unbleached sulfite pulp with a hot (60° C. or higher) aqueous solution containing strong alkali and at least about 1. weight percent of an inorganic boron compound dissolved therein.

3,594,271

STARCH-MODIFIED THERMOSETTING MELAMINE FORMALDEHYDE ACID COLLOID AND PAPER HAVING DRY STRENGTH MADE THEREWITH

Norman Thorndike Woodberry, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed July 19, 1968, Ser. No. 745,961

Int. Cl. C08b *21/00;* D21h *3/28, 3/56*

U.S. Cl. 162—167 8 Claims

The invention provides a starch-modified thermosetting melamine-formaldehyde acid colloid. The modified colloid is cationic and water-soluble, and imparts excellent dry strength to paper without imparting more than a negligible amount of wet strength. It is preferably employed as a beater additive but may be applied to preformed paper.

3,594,272

POLYMERIC PRODUCTS OF ALKYLENE-POLYAMINE-DIHYDROHALIDES, DICYANDIAMIDE, FORMALDEHYDE AND EPICHLOROHYDRIN AND THEIR USE AS RETENTION AIDS IN THE MANUFACTURE OF PAPER

Kwan Ting Shen, Lakewood, and Gary Wayne Jarvis, Toms River, N.J., assignors to Ciba Corporation, Summit, N.J.

No Drawing. Filed May 5, 1969, Ser. No. 822,034

Int. Cl. D21h *3/52;* C08g *9/00*

U.S. Cl. 162—167 6 Claims

New polymeric products are provided which are obtained by reacting together about 1 molar proportion of an alkylene-polyamine-dihydrohalide, about 2 molar proportions of dicyandiamide, about 3–5 molar proportions of formaldehyde and about 1–3 molar proportions of epichlorohydrin. The products of this invention are especially useful as retention aids in the manufacture of paper, textile and nonwoven fabrics.

3,594,273

SEQUENTIAL ACCRETION OF PLURAL-FIBER ARTICLES

John Covington Williams, Meriden, Conn., assignor to AMF Incorporated

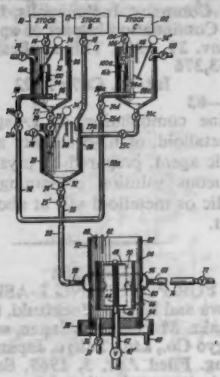
Filed May 15, 1967, Ser. No. 638,549

Int. Cl. B29j *5/00*

U.S. Cl. 162—219 17 Claims

A method and apparatus for accreting fibrous particles containing a plurality of fibrous components. A plurality of slurry tanks supply a plurality of different stock slurries to an accreting receptacle with an article former therein. The slurries are supplied to the accreting receptacle substantially at the mid-portion of the former. By means of a series of conduits and valves, the stock slurry tanks are serially interconnected so that the slurries may be supplied to the receptacle in any sequential order and in any mixed proportions, the conduits and valves being connected to the tanks so as to by-pass any particular

tank when desired. Another conduit and valve is provided to supply liquid directly to the receptacle so as to keep the former continuously submerged in liquid. Pre-



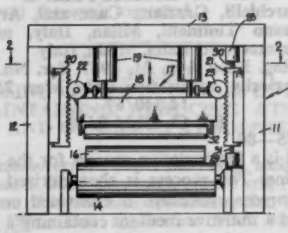
determined amounts of slurry are metered to the receptacle and each accretion depletes substantially the entire metered amounts.

3,594,274

SELECTIVE MECHANICAL ALIGNING AND EQUALIZING MEANS FOR ASBESTOS CEMENT TUBES

Frank A. Claessens, Somerville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed Apr. 21, 1969, Ser. No. 817,981
Int. Cl. B31c *1/00*
U.S. Cl. 162—284 **6 Claims**



A mechanical system for maintaining positive parallel alignment of a press section or other unit carrying beam member in relation to a press base during movements of the beam member to and away from the press base. The beam member is lowered to make contact with the press base by hydraulic cylinders and is guided and positively aligned in parallel relation to the press base through gear racks and gear pinions on opposite sides of the beam member. One gear rack is rigidly fixed and the opposite gear rack being slidable up and down parallel to the rigidly fixed gear rack to achieve a pivotally movable press member capable of producing tapered articles for example tapered asbestos cement pipes. The pinion gears, mounted on each end of the beam member and meshed with their corresponding gear racks are connected through beveled gears so that the pinion gears rotate in unison. The slidable gear rack is held in position corresponding with the position of the fixed gear rack by fluid actuated cylinders with pistons making contact with the ends of the gear rack. The pistons can be deactivated, freezing the slidable gear rack to move pivotally in making tapered articles.

3,594,275

METHOD FOR THE PRODUCTION OF COBALT-60 SOURCES AND ELONGATED HOLLOW COILED WIRE TARGET THEREFOR

Jackson A. Ransohoff, Bethesda, and Simon L. Lindbeck, Bowie, Md., assignors to Neutron Products, Inc., Washington, D.C.

Original application Apr. 22, 1966, Ser. No. 544,508. Divided and this application May 14, 1968, Ser. No. 737,251
Int. Cl. G21c *1/00*
U.S. Cl. 176—12 **5 Claims**

A unique method of producing cobalt-60 sources which accommodates both the needs of the reactor designer, the fuel cycle manager, and the cobalt-60 user is disclosed. The cobalt-60 source is produced by irradiating, in a nuclear reactor, natural cobalt wire which has been formed into a helical coil. The wire may be clad with a corrosion resistant material before winding, or the spring may be encapsulated in a corrosion protective cladding after it has been formed. The cobalt-60 sources produced may be used in the same geometry in which they are irradiated, or the geometry may be changed prior to use to affect a different distribution of activity.

3,594,276

LEUKOCYTE SEPARATION METHOD

Lester P. Shepherd, Los Angeles, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Filed Apr. 10, 1969, Ser. No. 815,234
Int. Cl. A61k *27/00*
U.S. Cl. 195—1.8 **2 Claims**

A method of separating leukocytes from whole blood without agglutination of the erythrocytes consisting of mixing defibrinated whole blood with a liquid extract of the seeds of the Fenugreek herb.

3,594,277

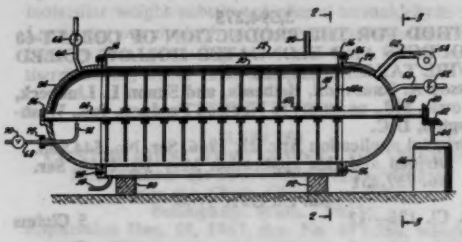
PROCESS FOR FERMENTING HYDROCARBONS

Peter F. Mako, Fullerton, Calif., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Apr. 23, 1968, Ser. No. 723,457
Int. Cl. C12b *1/00*; C12d *13/06*
U.S. Cl. 195—28 **2 Claims**

A fermentor comprising a normally horizontal cylindrical chamber having closed ends and including a plurality of apertured discs rotatably mounted in the cylinder, inlet conduits for biological nutrients and air at one end of the closed cylinder and conduits for removing air, spent nutrients and biological products at the other end

of the cylinder, the discs being adapted for continuously rotatably carrying portions of liquid nutrient from the



bottom of the cylinder into a gas phase at the top of the cylinder, is disclosed.

3,594,278

PREPARATION OF POLYNUCLEOTIDES

Robert Naylor, Glendale, Wis., assignor to Pabst Brewing Company, Milwaukee, Wis.

No Drawing. Filed Dec. 31, 1968, Ser. No. 788,319

Int. Cl. C12d *13/06*

U.S. Cl. 195—28 **8 Claims**

Polynucleotides are prepared by enzymatic polymerization of a nucleotide, e.g., inosine diphosphate or cytidine diphosphate, followed by a recovery process employing a surfactant and a finely divided solid adsorbent which yields an active polynucleotide free from impurities.

3,594,279

PROCESS FOR PRODUCING L-TRYPTOPHAN

Kiyoshi Nakayama, Sagamihara-shi, and Hiroshi Hagino, Hachioji-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,557

Claims priority, application Japan, Jan. 24, 1968, 43/3,715

Int. Cl. C12d *13/06*

U.S. Cl. 195—28 **11 Claims**

L-tryptophan is produced by fermentation by a process which comprises culturing a histidine-requiring microorganism belonging to the genus Arthrobacter, Bacillus or Corynebacterium under aerobic conditions in an aqueous nutrient medium. Inexpensive carbohydrates or hydrocarbons can be used as the carbon source in the medium. The strains exemplified include *Arthrobacter paraffineus*, *Bacillus subtilis* and *Corynebacterium glutamicum*.

3,594,280

PROCESSES FOR CARRYING OUT POLYSACCHARIDE-PRODUCING FERMENTATIONS

Pierre Colin and Michel Fleury, Melle, France, assignors to Melle-Bezons, Melle, France

No Drawing. Continuation-in-part of application Ser. No. 717,017, Mar. 28, 1968. This application May 28, 1970, Ser. No. 41,600

Int. Cl. C12d *13/00*

U.S. Cl. 195—31 **7 Claims**

A fermentation process for producing polysaccharides by fermentations with microorganisms of the class Xanthomonas in which the broth containing carbohydrate is seeded with a volume of inoculum which does not exceed 2 parts by volume per 1000 parts by volume of broth and preferably less than 0.5 to 1 part by volume per 1000 parts by volume of broth with the medium utilized in preparation of the inoculum preferably being formulated to correspond with the composition of the broth.

3,594,281

CRYSTALLINE COMBINATION OF L-ASPARAGINASE AND A METAL OR METALLOID AND METHOD OF ITS MANUFACTURE

Peter P. K. Ho, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 780,251, Nov. 29, 1968. This application Oct. 2, 1969, Ser. No. 863,376

Int. Cl. C07g *7/02*

U.S. Cl. 195—63 **10 Claims**

A crystalline combination of L-asparaginase and a metal or a metalloid, of high activity as an enzyme and as an oncolytic agent, prepared by crystallization thereof from an aqueous solution containing L-asparginase a soluble metallic or metalloid salt at about pH 6.0–9, and an antisolvent.

3,594,282

PROCESS FOR PURIFYING L-ASPARAGINASE

Tsuneo Kagawa and Kazuo Mochizuki, Shizuoka-ken, and Masao Tanaka, Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Apr. 3, 1969, Ser. No. 813,287

Claims priority, application Japan, Apr. 5, 1968, 43/22,328

Int. Cl. C07g *7/028*

U.S. Cl. 195—66A **15 Claims**

A process for purifying L-asparaginase obtained from cells while maintaining the enzymic activity thereof. An extract from the cells is adjusted to a pH of 4.5 or less, thereby denaturing, coagulating and precipitating unnecessary proteins therefrom. A supernatant portion of the extract is then adsorbed on an ion exchanger and the L-asparaginase eluted therefrom. Alternatively, the pH of the supernatant can be adjusted to 8 or more, adsorbed by ion exchange and the L-asparaginase eluted. A loss of enzymic activity is encountered with a pH range of 4.5 to 8.0.

3,594,283

FERMENTATIVE PROCESS FOR THE PREPARATION OF TETRACYCLINE

Riccardo Barchielli, Graziana Canevazzi, Arpad Grein, and Romano Tintinelli, Milan, Italy, assignors to Società Farmaceutici Italia, Milan, Italy

No Drawing. Filed Aug. 21, 1967, Ser. No. 661,826

Claims priority, application Italy, Mar. 23, 1967, 14,040/67

Int. Cl. C12d *9/18*

U.S. Cl. 195—80 **2 Claims**

Described is a fermentative process for the preparation of tetracycline. The process is characterized in that the new *Sterptomyces avellaneus* is cultivated under aerobic conditions in a nutritive medium containing a carbon and nitrogen source and mineral salts at a temperature of from 22° to 35° C. over a period of from 72 to 168 hours at a pH of from 6.0 to 7.2. The thus obtained tetracycline is separated from the fermentation broth and purified as such or transformed in known manner into its salts with non-toxic pharmaceutically acceptable inorganic or organic acids.

3,594,284

LYSOSTAPHIN FERMENTATION WITH ACCELERATED TIME CYCLE

Walter Anthony Zygmunt and Henry Polk Browder, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Filed June 4, 1968, Ser. No. 734,201

Int. Cl. C12d *9/00*

U.S. Cl. 195—96 **6 Claims**

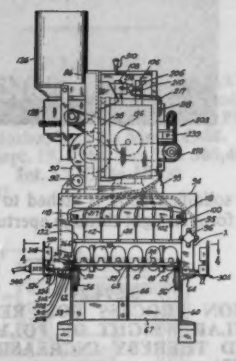
Reduced fermentation periods are obtained in the lysostaphin fermentation when heat sterilization of the medium is eliminated and an inoculum volume of from 2.5% to 20% is employed. A cyclic process in which an aliquot of one batch serves as inoculum for the next is described.

3,594,285

MACHINE FOR INJECTING INFLUENZA SEED VIRUS INTO EGGS

Oscar B. Noren, Grosse Pointe Farms, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Dec. 29, 1966, Ser. No. 605,632
Int. Cl. C12k *1/10*
U.S. Cl. 195—127 18 Claims



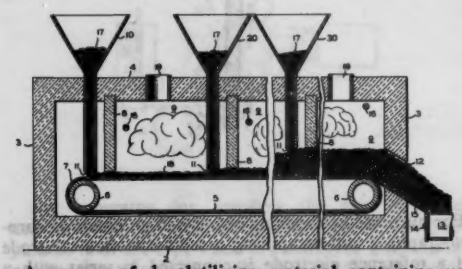
Apparatus for automatically transporting, locating and fixturing one or more eggs or the like while the same are arranged in a predetermined array on a flat egg tray or similar support, and for performing an operation on the egg or other supported object while so fixtured. In particular, the machine automatically cycles to lower an array of hollow piercing needles corresponding in number to the fixtured eggs so that the needles pierce the imperforate upper surface of the large end of the eggshell. A liquid containing influenza seed virus is supplied to the needles by a pump which is synchronized to meter a given quantity of liquid to the needle such that this amount of liquid is injected into the egg when the needle is approximately bottomed in its egg piercing and penetrating stroke. The needle is then withdrawn, the tray advanced and the cycle repeated.

3,594,286

CARBONIZING MULTIPLE LAYERS OF MATERIAL BY MAINTAINING REDUCING ATMOSPHERE IN BED AND OXIDIZING ATMOSPHERE ABOVE BED

John L. Kemmerer, Jr., Short Hill, N.J., assignor to Wise Coal & Coke Company, New York, N.Y.

Continuation of abandoned application Ser. No. 526,245, Feb. 9, 1966. This application Mar. 31, 1970, Ser. No. 22,118
Int. Cl. C10b *47/20*
U.S. Cl. 201—27 8 Claims



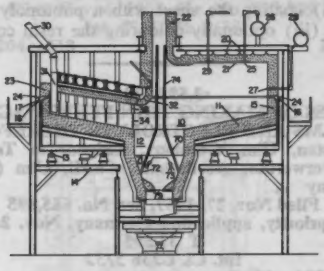
A process of devolatilizing material containing volatiles which involves the feeding of such materials onto a moving hearth in a series of successively applied shallow layers wherein each such applied layer is at least partially devolatilized before application of the next successive layer and under the action of the radiant heat of a preceding layer and radiant heat derived from combustion of evolved volatiles.

3,594,287

APPARATUS FOR COOLING SOLIDS BY DIRECT CONTACT WITH LIQUIDS

Victor D. Allred, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 22, 1969, Ser. No. 887,449
Int. Cl. C10b *7/02, 39/06*
U.S. Cl. 202—103 6 Claims



Into the soaking pit of a rotary hearth calciner is inserted an inverted funnel smaller in diameter than the soaking pit and having internal water sprays directed on hot material flowing underneath the funnel. The water cools the coke directly, generating steam which flows up through the funnel and out through the conventional calciner stack.

3,594,288

PROCESS FOR ELECTROPLATING NICKEL ONTO METAL SURFACES

David H. Reinert, Wayne, Pa., assignor to The Boeing Company, Seattle, Wash.

No Drawing. Filed July 31, 1968, Ser. No. 748,965
Int. Cl. C23b *1/00, 5/46, 5/08*
U.S. Cl. 204—34 6 Claims

An adherent, wearable nickel coating is applied to a metal surface by a multistep process in which the metal surface is (a) subjected to an anodic current density in an aqueous acid treatment bath, preferably containing sulfuric acid in an amount between about 20 and 30% by volume, at a bath temperature of 40 to 85° F. and a current density of 75 to 250 a.s.f.; (b) coated with a thin nickel base coat by means of a nickel strike applied from an electroplating bath preferably containing 30 to 34 oz./gal. of nickel chloride and 9 to 12% by volume of hydrochloric acid, and utilizing a 99% minimum purity nickel anode and a cathodic current density between about 50 and 100 a.s.f., and (c) then applying a nickel coating of the desired thickness to the metal surface in a nickel sulfamate plating bath maintained at a temperature of 110 to 125° F. and at a pH of 3.5 to 4.2. The nickel sulfamate plating bath preferably contains 62 to 66 oz./gal. of nickel sulfamate (27 to 31° Bé.), 0.7 to 2.0 oz./gal. nickel chloride, 4 to 5 oz./gal. boric acid, 1 to 3 oz./gal. naphthylene trisulfonic acid, and a sufficient quantity of an organic wetting agent to maintain the bath surface tension at between about 20 and 60 dynes/cm.^{2}. A 99% minimum purity nickel anode is used in the nickel sulfamate plating bath and plating is carried out at a current density preferably between 60 and 100 a.s.f.

This process can be applied to various metal surfaces including copper, brass and both high and low carbon steels. The resultant article has an adherent, wearable nickel coating having an excellent combination of hardness, ductility and compressive stress properties.

3,594,289

PROCESS FOR PREPARING A PRESENSITIZED PHOTOLITHOGRAPHIC PRINTING PLATE

Leonard James Watkinson, Leeds, and Brian Joseph Moore, Garforth, Leeds, England, assignor to W. H. Howson Limited, Seacroft, Leeds, England

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,164
Claims priority, application Great Britain, Nov. 15, 1967, 52,084/67
Int. Cl. C23f *17/00*; C23b *9/02*
U.S. Cl. 204—38A 12 Claims

Process for producing a presensitised lithographic printing plate comprising (i) anodising a sheet of aluminium or aluminium alloy using a phosphoric acid as electrolyte (ii) coating the sheet with a photopolymerisable resin and (iii) optionally colouring the resin coating.

3,594,290

PROCESS OF MAKING THIN FERROMAGNETIC FILMS AND ELECTROLYTE THEREFOR

Josef Jostan, Ulm, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany

Filed Nov. 27, 1967, Ser. No. 685,895
Claims priority, application Germany, Nov. 26, 1966, T 32,595
Int. Cl. C23b *5/32*
U.S. Cl. 204—43 7 Claims

An improvement in a process for making thin ferromagnetic films and an electrodeposition bath for use in the process. The process involves the electrodeposition of nickel and iron onto a cathode substrate from a bath containing nickel and iron salts. The improvement comprises the steps of adding selenium compounds to the bath and maintaining the pH of the bath at less than 3. The bath for use in the process contains selenium compounds in addition to the nickel and iron salts and has a pH which is less than 3.

3,594,291

BRIGHT ZINC PLATING FROM AN ACID ELECTROLYTE

Hans-Gunther Todt and Günter Voss, Berlin, Germany, assignors to Schering AG, Berlin, Germany

No Drawing. Filed July 24, 1969, Ser. No. 844,644
Claims priority, application Germany, Aug. 10, 1968, P 17 17 983.4
Int. Cl. C23b *5/12*, *5/46*
U.S. Cl. 204—55 8 Claims

Mirror bright zinc electrodeposits are formed from acid zinc plating solutions containing as brighteners N-polyvinylpyrrolidone-(2) and a ketone of the formula

$$R_1—(CH=CH)_n—CO—R_2$$

wherein R_1 is phenyl, mono- or dihydroxyphenyl or trihydroxyphenyl methylenedioxyphenyl, mono-, di- or tri-lower-alkylphenyl, mono- or di- or tri-lower-alkoxyphenyl, furyl, thienyl, coumaryl, or pyridyl, and R_2 may be lower alkyl, lower alkenyl, lower-alkyl-carbonyl-lower-alkylene, cyano-lower-alkylene, lower-alkoxy-carbonyl-lower-alkylene, or —$(CH=CH)_n—C_6H_5$, *n* being 1 or 0.

3,594,292

PROCESS FOR PRODUCING ARTICLES WITH APERTURES OR RECESSES OF SMALL CROSS-SECTION AND ARTICLES PRODUCED THEREBY

Robert R. Russell, Burnt Hills, Harvey E. Cline, Latham, and Warren De Sorbo, Ballston Lake, N.Y., assignors to General Electric Company

Filed Dec. 30, 1968, Ser. No. 787,802
Int. Cl. B23p *1/00*; B29c *17/08*; B22d *7/10*
U.S. Cl. 204—143 15 Claims

A process for preparing a body with substantially parallel apertures of small cross-section useful as a filter. An alloy is cast which is in the solid state is comprised of at least two phases. The cast alloy is directionally solidified to produce a body wherein one of the phases is present as a plurality of substantially parallel rods passing through a matrix comprised of the second or other phases. The

directionally solidified body is etched to remove the rod-like phase to form straight-through apertures or, if desired, recesses.

3,594,293

IRRADIATION PROCESS FOR REDUCING THE MOLECULAR WEIGHT OF POLYOXYMETHYLENE AND THEREBY INCREASING THERMAL STABILITY

Nelson Samuel Marans, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 476,727, Aug. 2, 1965. This application May 24, 1968, Ser. No. 731,734
Int. Cl. C08d *1/00*; C08f *1/16*
U.S. Cl. 204—159.21 4 Claims

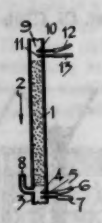
A process for rendering polyoxymethylene polymers and copolymers thermally stable while simultaneously reducing their molecular weights. Polyoxymethylene of a high molecular weight is subjected to ionizing radiation of about 0.000015–5 mev. at a dosage of about 0.01 to 2.0 megarads. The irradiated polymer has a much greater thermal stability than the non-irradiated polymer, as well as a substantially reduced molecular weight.

3,594,294

DETECTION METHOD AND APPARATUS FOR CHROMATOGRAPHY

Victor Pretorius and Hans Helmut Hahn, both of 38 Marais St., Bailey's Muckleneuk, Pretoria, Transvaal, Republic of South Africa

Filed Oct. 3, 1966, Ser. No. 583,788
Claims priority, application Republic of South Africa, Oct. 6, 1965, 65/5,409; Aug. 2, 1966, 66/4,568
Int. Cl. B01k *5/00*
U.S. Cl. 204—180G 23 Claims



For purposes of detecting changes in an eluate in chromatography a cell comprising a solid detection electrode and a reference electrode is connected in series with a chromatographic separating system, the detection electrode being in direct flowing contact with the eluate and a liquid (which may be the eluate itself). A controlled potential difference is applied to the electrodes to bring about a chemical oxidation/reduction reaction of the substances

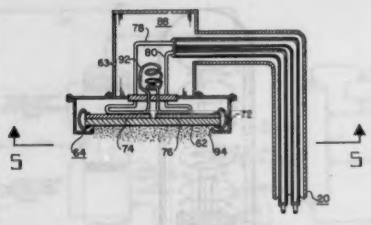
being separated and the relationship between at least two quantities inter-related by Ohm's law is observed. Provision is made for a compensatory cell and for the electro-chemical removal from the eluant of impurities which interfere with the detection. A preferred cell is tubular with the electrodes e.g. of graphite or glassy carbon provided by the walls of the cell or extending across the cell.

3,594,295

RF SPUTTERING OF INSULATOR MATERIALS

Benjamin B. Meckel, La Mesa, and Bernd H. Richelmann, San Diego, Calif., assignors to Physics Technology Laboratories, Inc., La Mesa, Calif.

Filed Sept. 19, 1966, Ser. No. 580,404
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 11 Claims



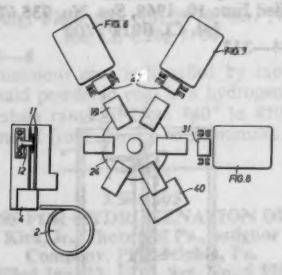
Method and apparatus for sputtering electrically nonconductive material wherein potentials of opposite polarities are applied to a target of nonconductive material which polarities are alternated at (RF) radio frequencies. The sputtering discharge may also be supported by RF potentials.

3,594,296

APPARATUS FOR GRINDING THE TIPS OF INJECTION NEEDLES

Karlheinz Derwall, Wurselen, near Aachen, Germany, assignor to SCHUMAG Schumacher Metallwerke Gesellschaft mit Beschrankter Haftung, Aachen, Germany

Filed Nov. 14, 1967, Ser. No. 682,750
Claims priority, application Germany, Nov. 15, 1966, Sch 39,817
Int. Cl. B25g *29/00*
U.S. Cl. 204—200 13 Claims



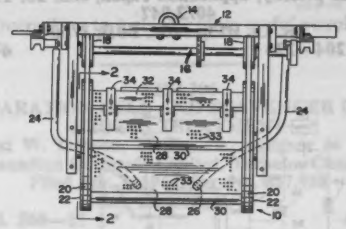
An apparatus for grinding the tips of injection needles which are used in hypodermic syringes. The apparatus is of the type wherein electrolytic grinding of the needle tips takes place while the needles are held and ground with a grinding disc during feeding of the electrolyte to the grinding area, the apparatus including the required electrical structure. A holding means is provided for holding a plurality of needles simultaneously during simultaneous grinding of the tips thereof, and a feeding means automatically feeds a plurality of needles to the holding means so that a plurality of needles will be simultaneously held thereby. A control means controls the movement of the holding means and a grinding means one relative to the other so as to bring about the grinding operations, and a removing means is provided for removing the finished needles from the holding means.

3,594,297

REINFORCED PLATING BARREL

Albert Singleton, 7360 Brookside Parkway, Middleburg Heights, Ohio

Filed Nov. 6, 1968, Ser. No. 773,929
Int. Cl. C23b *5/78*
U.S. Cl. 204—213 10 Claims



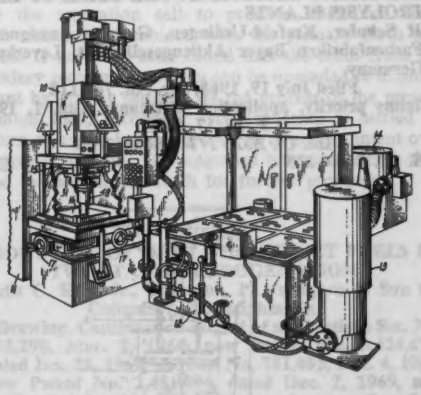
A plating or metal finishing barrel of generally polygonal shape having a work receiving cavity formed by rectangular side panels and end wall. The side panels are secured in side edge-to-side edge alignment with the end walls secured to the end edges of the panels. A reinforcing plug of substantially the same material as the side panels and end walls is friction welded and thereby fused to one end wall and the meeting edge of a side panel side edge.

3,594,298

PORTABLE MANIFOLD FOR ELECTRO-EROSIVE MACHINES

Ronald C. Abt, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 19, 1968, Ser. No. 785,226
Int. Cl. B23p *1/04, 1/12*
U.S. Cl. 204—224 8 Claims



This disclosure describes a portable manifold assembly useful in the electro-erosive machining processes. The portable manifold is a telescoping shroud supported from the cathode mounting plate and extending around the length of the tool in spaced relationship with the tool. The space between the tool and the shroud is connected

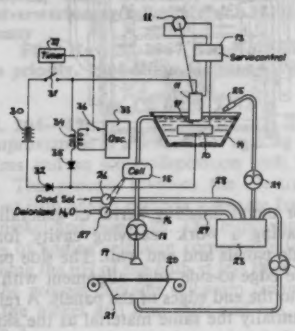
to the fluid supply passage. The shroud is biased forward to contact and seal against the workpiece by the force of the fluid against the end faces of the telescoping shroud members. An O-ring seal is mounted in the end of the shroud to seal against the workpiece on contact. There is also provided a quick-change tooling system which can be used with the portable manifold of this invention.

3,594,299

APPARATUS FOR ELECTRICAL MACHINING OF METALLIC WORKPIECES

Kiyoshi Inoue, 182, 3-chome, Tamagawayoga-machi, Satagaya-ku, Tokyo-to, Japan

Original application Jan. 19, 1966, Ser. No. 535,268, now Patent No. 3,417,006, dated Dec. 17, 1968. Divided and this application Aug. 30, 1968, Ser. No. 824,014
Claims priority, application Japan, Jan. 20, 1965, 40/2,947
Int. Cl. B23p *1/04*; B01k *3/00*
U.S. Cl. 204—224 4 Claims



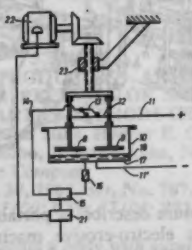
An apparatus for electrically machining a metallic workpiece in which a first source of electric current is connected between the workpiece and the tool electrode for electrochemical erosion as the workpiece is juxtaposed with the tool electrode and in contact with an electrolyte. A second source of electric current applies spark discharge pulses in addition.

3,594,300

APPARATUS FOR INDICATING AND ELIMINATING SHORT CIRCUITS IN THE CELLS OF ELECTROLYSIS PLANTS

Rolf Schafer, Krefeld-Urdingen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 19, 1968, Ser. No. 746,118
Claims priority, application Germany, Aug. 1, 1967, P 16 17 431.1
Int. Cl. B32p *1/14*; B01k *3/00*
U.S. Cl. 204—225 1 Claim



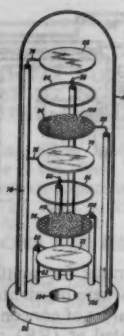
Improvements in the operation of an electrolytic cell and/or a battery of such cells such as set forth in application Ser. No. 660,815, filed Aug. 15, 1967, wherein the switch means of a circuit activates a relay means which in turn activates a motor means which functions to adjust the gap or distance between the anode and the cathode of such electrolytic cell and which device and circuit may also contain means for measuring when the anode and cathode have a short circuit therebetween whereby activating the switch means and means for detecting the opening of the short circuit so as to control the motor and adjusting means thereby.

3,594,301

SPUTTER COATING APPARATUS

Charles A. Bruch, Cincinnati, Ohio, assignor to General Electric Company

Filed Nov. 22, 1968, Ser. No. 778,155
Int. Cl. C23c *15/08*
U.S. Cl. 204—298 14 Claims



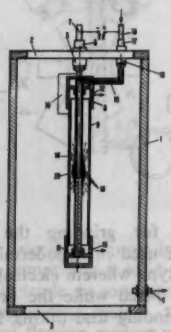
Apparatus for efficiently providing ionic cleaning and sputter coating of materials. The sputtering apparatus basically includes at least two targets (cathodes) with a porous anode located therebetween with the material to be coated positioned between at least one of the targets and the anode. The use of a porous anode allows sputtering atoms to pass therethrough to provide substantially uniform coating of the material.

3,594,302

APPARATUS FOR IMPROVING THE CHEMICO-THERMAL SURFACE TREATMENT OF TUBES

Horst Edmund Rordorf, Weiningen, Zurich, Switzerland, assignor to Elektrophysikalische Anstalt Bernhard Berghaus, Vaduz, Liechtenstein

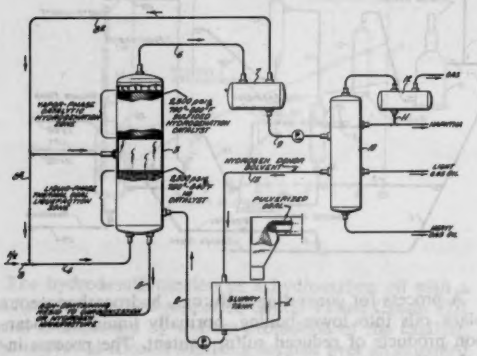
Filed June 10, 1968, Ser. No. 735,675
Int. Cl. B01k *1/00*
U.S. Cl. 204—312 2 Claims



An apparatus for hardening tubular workpieces by electrical glow discharge in a gas atmosphere. Gas is

delivered into a glow discharge chamber through a pipe functioning as an anode and discharging gas within the tubular workpiece, generally midway of its ends, through openings in the pipe. Baffle means further deflect the gas to effect efficient distribution thereof over the interior surface of the workpiece, which is connected as a cathode.

3,594,303
COAL HYDROGENATION PROCESS
Merritt C. Kirk, Jr., Thornton, and Walter H. Seltzer, West Chester, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
Filed Feb. 18, 1970, Ser. No. 12,195
Int. Cl. C10g *1/08*
U.S. Cl. 208—8 **6 Claims**



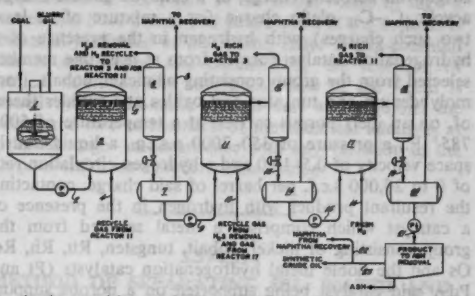
A process for hydrogenation of coal where a slurry of pulverized coal in a hydrogen donor solvent is hydrogenated in the liquid phase in the absence of catalyst, vapors from this first hydrogenation are then subjected to a vapor phase hydrogenation in the presence of a sulfided catalyst and thereafter the products of the reaction are separated.

3,594,304
THERMAL LIQUEFACTION OF COAL
Walter H. Seitzer, West Chester, and Robert W. Shinn, Chester, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Apr. 13, 1970, Ser. No. 27,975
Int. Cl. C10g *1/04*
U.S. Cl. 208—8 **4 Claims**

A sub-bituminous coal is liquefied by rapidly heating a slurry of said powdered coal in a hydrogenated solvent at a temperature range of from 440° to 450° C., and a residence time of from about 5 to 20 minutes.

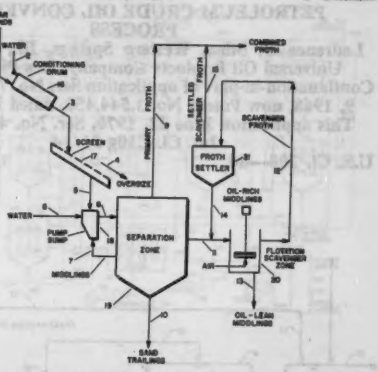
3,594,305
PROCESS FOR HYDROGENATION OF COAL
Merritt C. Kirk, Jr., Thornton, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
Filed Jan. 23, 1970, Ser. No. 5,328
Int. Cl. C10g *1/04*
U.S. Cl. 208—10 **3 Claims**

Process of obtaining hydrocarbons from coal by treating a hydrocarbon oil-coal slurry with hydrogen under catalytic conditions in an ebullated bed system where the reaction involves a series of reactors, each reactor increasing in temperature and pressure, oxygen and sulfur removal occurring in the first series of reactors and finally passing the oil-coal slurry through one or more final reactors which contain catalyst different from the upstream reactors to remove nitrogen compounds and complete hydrogenation, whereby an effluent is obtained suitable



for hydrocracking to fuels and other useful petroleum-like products.

3,594,306
SEPARATION CELL AND SCAVENGER CELL FROTHS TREATMENT
Ernest W. Dobson, Media, Pa., assignor to Great Canadian Oil Sands Limited, Toronto, Canada
Filed Apr. 3, 1967, Ser. No. 627,958
Int. Cl. C07g *1/04*
U.S. Cl. 208—11 **4 Claims**



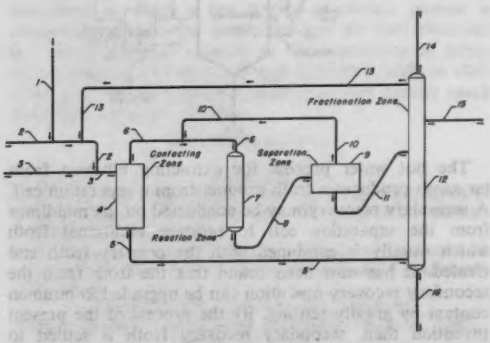
The hot water process for extracting bitumen from tar sands produces a froth product from a separation cell. A secondary recovery may be conducted on the middlings from the separation cell to produce additional froth which usually is combined with the primary froth and treated. It has now been found that the froth from the secondary recovery operation can be upgraded in bitumen content by gravity settling. By the process of the present invention then, secondary recovery froth is settled to produce an upper layer upgraded in bitumen content over the secondary froth. This upgraded bitumen layer is then added to the primary froth for further processing.

3,594,307
PRODUCTION OF HIGH QUALITY JET FUELS BY TWO-STAGE HYDROGENATION
Merritt C. Kirk, Jr., Thornton, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Continuation-in-part of applications Ser. No. 532,298, Mar. 7, 1966, now Patent No. 3,424,673, dated Jan. 28, 1969, and Ser. No. 781,095, Dec. 4, 1968, now Patent No. 3,481,996, dated Dec. 2, 1969, said application Ser. No. 781,095 being also a continuation-in-part of said application Ser. No. 532,298. This application Feb. 14, 1969, Ser. No. 799,499
Int. Cl. C10g *23/02*
U.S. Cl. 208—57 **9 Claims**

Process of producing a jet fuel having a luminometer number of at least 75 comprises contacting a charge com-

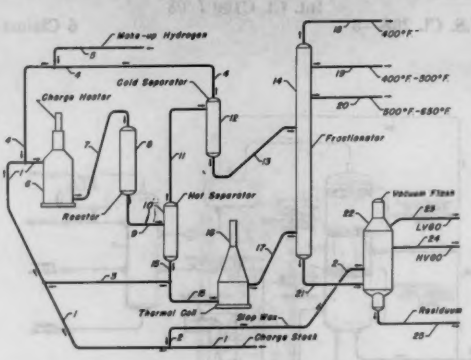
prising jet fuel range distillate from coked (thermally cracked) tar sands bitumen (such as that separated from Athabasca tar sands by the hot water process) or a stright-run kerosene charge, or a catalytic gas oil charge, acyclic C_9–C_{18} olefin charge (or a mixture of at least two such charges) with hydrogen in the presence of a hydrogenation catalyst formed from at least one member selected from the group consisting of nickel, cobalt, iron, molybdenum and tungsten and oxides and sulfides thereof, on an inert porous carrier, at a temperature of 500–785° F., a pressure of 350–2000 p.s.i.g., a liquid hourly space velocity of 0.5–10.0 and a hydrogen circulation rate of 0 to 20,000 s.c.f. per barrel of said charge, contacting the resultant product with hydrogen in the presence of a catalyst which comprises a metal selected from the group consisting of nickel, cobalt, tungsten, Ru, Rh, Re, Os and the noble metal hydrogenation catalysts (Pt and Pd), said catalyst being supported on a porous support (e.g., alumina, kieselguhr) at a temperature of 450–775° F., at a pressure of 500–3000 p.s.i.g., a liquid hourly space velocity of 0.1–10.0 and a hydrogen circulation rate of 0–20,000 standard cubic feet per barrel of said product of the first stage, the combination of conditions being selected to produce a jet fuel having an ASTM smoke point of at least 32±3.

3,594,308
PETROLEUM CRUDE OIL CONVERSION PROCESS
Laurence O. Stine, Western Springs, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Continuation-in-part of application Ser. No. 758,217, Sept. 9, 1968, now Patent No. 3,544,450, dated Dec. 1, 1970. This application June 22, 1970, Ser. No. 48,371
Int. Cl. C10g *21/14*
U.S. Cl. 208—86 **8 Claims**



A petroleum crude oil feedstock is converted into a more valuable hydrocarbon product by a combination process including the steps of contacting the feedstock in a contacting zone with a light hydrocarbon solvent, separating the resulting mixture to provide a light hydrocarbon fraction and a heavy hydrocarbon fraction, hydrorefining the light hydrocarbon fraction, passing a resulting hydrorefined effluent hydrocarbon and the heavy hydrocarbon fraction into a distillation zone, and recovering the desired hydrocarbon product from the distillation zone. The light hydrocarbon solvent contains hydrocarbon having less than six carbon atoms per molecule, and the hydrorefined effluent hydrocarbon contains species having less than six carbon atoms per molecule, whereby at least a portion of the light hydrocarbon solvent passed into the contacting zone is obtained from the distillation zone. The process has particular application to hydrotreating and hydrocracking heavy feedstocks containing a significant quantity of asphaltic materials, organo-metallic complexes, sulfur compounds, and nitrogen compounds, wherein at least about 10% by volume of the feedstock boils at a temperature in excess of about 1050° F.

3,594,309
CONVERSION AND DESULFURIZATION OF HYDROCARBONACEOUS BLACK OILS
Frank Stolfa, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Oct. 28, 1968, Ser. No. 771,248
Int. Cl. C10g *37/04*
U.S. Cl. 208—89 **4 Claims**



A process for converting sulfurous, hydrocarbonaceous black oils into lower-boiling, normally liquid hydrocarbon products of reduced sulfur content. The process involves the integration of hydrogenative cracking and fixed-bed catalytic desulfurization, and is especially applicable to those hydrocarbon charge stocks containing less than 150 p.p.m. of metallic contaminants. The charge stock is initially subjected to fixed-bed catalytic hydrogenation and desulfurization. Following separation of the catalytic reaction zone product effluent, a high-boiling concentrate is thermally-cracked in the presence of dissolved hydrogen.

3,594,310
HYDROCRACKING CATALYST
Ernest L. Pollitzer, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of application Ser. No. 723,886, Apr. 24, 1968. This application Mar. 20, 1969, Ser. No. 808,999
Int. Cl. C10g *13/02*
U.S. Cl. 208—111 **7 Claims**

A hydrocracking catalyst of a crystalline alumino-silicate carrier material, a Group I–B metal component having an atomic number below 79, and a Group VII–B metal component having an atomic number above 25. The crystalline alumino-silicate carrier is substantially pure, being at least about 90.0% by weight zeolitic.

3,594,311
CONVERSION PROCESS
Vincent J. Frilette, Delaware Township, Camden County, N.J., and Paul B. Weisz, Media, Pa., assignors to Mobil Oil Corporation
No Drawing. Continuation-in-part of application Ser. No. 754,915, Aug. 14, 1958, now Patent No. 3,140,322. This application Mar. 19, 1963, Ser. No. 266,186
The portion of the term of the patent subsequent to July 7, 1981, has been disclaimed
Int. Cl. C10g *13/02, 11/02*
U.S. Cl. 208—111 **21 Claims**

Normal aliphatic hydrocarbons in a feed are selectively cracked or hydrocracked by contacting said feed under

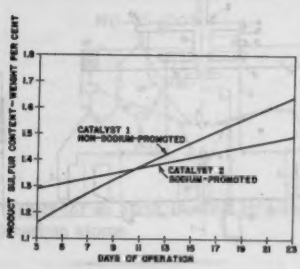
conversion conditions with a crystalline acid aluminosilicate having a pore size of about 5 angstroms, and a silicon to aluminum ratio of at least 1.8.

3,594,312

HYDRODESULFURIZATION PROCESS UTILIZING A CATALYST PROMOTED WITH AN ALKALI METAL

Robert D. Christman, Penn Hills Township, and Joel D. McKinney, Indiana Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 17, 1969, Ser. No. 858,585
Int. Cl. C10g 23/02
U.S. Cl. 208—216 6 Claims



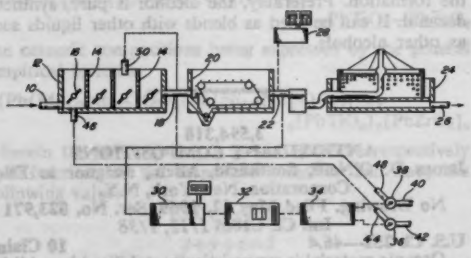
The hydrodesulfurization of a hydrocarbon oil with a catalyst comprising a supported Group VI and Group VIII metal is improved by sodium promotion of the catalyst. The improved effect is suprising because over an extended initial stage of the process the sodium acts as a catalyst poison and depresses catalyst activity. However, after a period of aging the hydrodesulfurization activity of the sodium-promoted catalyst emerges superior to that of the non-promoted catalyst. The superior activity of the aged sodium-promoted catalyst is inexplicable in view of the fact that the carbon, sulfur and metals laydown on the aged sodium-promoted catalyst is about as high as on the aged non-sodium-promoted catalyst.

3,594,313

LIQUID PURIFICATION SYSTEM WITH ZETA-POTENTIAL CONTROL OF CHEMICAL ADDITIVES

Rolf C. Carlson, Levittown, Pa., assignor to International Waterpure Corporation, Fallsington, Pa.

Filed Apr. 13, 1970, Ser. No. 27,807
Int. Cl. C02b 1/20
U.S. Cl. 210—18 9 Claims



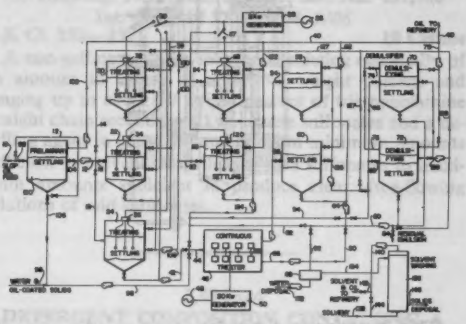
An anti-pollution system for flowing liquids which is particularly adapted to the treatment of flowing aqueous systems polluted with sewage, industrial wastes, or the like. The system is especially adapted to remove colloids from the liquid by causing flocculation and coagulation of the colloids. This is accomplished by controlling the zeta-potential of the liquid at the initial stages in such a manner that flocculation and coagulation of the colloids is substantially effected at that point. After a zeta-potential value is determined and obtained by the insertion of chemical additives, the subsequent flow of the liquid is scanned by an automatic control unit which adjusts the amount and rate of insertion of the chemical additives at the initial stages in accordance with any variation of the zeta-potential from a predetermined value.

3,594,314

METHOD OF SEPARATING OIL, WATER AND SOLIDS BY ULTRASONIC TREATMENT

James R. Bilhartz, 3220 Cliffoak Drive, Dallas, Tex. 75233, and Alden G. Nellis, Jr., 1709 Winthrop, Irving, Tex. 75060

Filed Feb. 12, 1969, Ser. No. 798,664
Int. Cl. B01d 17/04
U.S. Cl. 210—19 28 Claims



A method for treating waste materials containing oil, water, oil and water emulsions, and oil-coated solids, particularly slop oil from an integrated petroleum refinery, to separate oil, water and solids which can be utilized or disposed of without environmental contamination, in which the waste material is subjected to ultrasonic treatment at subcavitation power levels and permitted to settle, for example at a power level of about 2 to 10 watts per barrel of oil and with hourly alternate treatment for 5 to 30 minutes and settling for 30 to 55 minute periods for an 8-hour treating cycle, followed by a 16-hour settling period, to provide a 24-hour total time cycle; a clarified oil phase is recovered as an upper phase; a lower phase is removed and subjected to ultrasonic treatment at cavitation power levels, for example in a continuous flow operation and at a power level of about 1 to 10 kilowatt hours per barrel of fluid treated; the cavitated product is then separated to recover an upper free oil phase and a lower water and solids phase; and the water and solids are then separated for use and/or disposal. The lower phase of sonically treated products from either the subcavitation treatment or the cavitation treatment or both may be further separated to recover an intermediate emulsion phase and this emulsion phase may be recycled to the subcavitation treatment while the remaining water and solids phase is subjected to cavitation treatment. Alternatively, an intermediate emulsion phase from the first subcavitation treatment

may be separated and subjected to a second subcavitation treatment prior to subjecting the bottoms product to the cavitation treatment. The water and solids from the process may be separated by filtering or centrifuging and, if desired, the solids material recovered may be washed with a solvent to remove any residual oil therefrom.

3,594,315

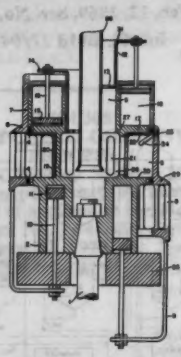
PROCESS FOR THE SEPARATION OF SOLIDS FROM A LIQUID BY MEANS OF AN ARTIFICIAL GRAVITATIONAL FIELD

Eberhard Otto Gert Buban, Munich-Allach, Germany, assignor to N.V. Motorenfabriek Thomassen, De Steeg, Netherlands

Continuation of application Ser. No. 496,737, Sept. 30, 1965. This application May 5, 1969, Ser. No. 821,974

Int. Cl. B01d *37/00*

U.S. Cl. 210—73 **4 Claims**



This invention is directed to a process for separating solids from a liquid, by way of example in purifying sewage waters and settling sludges by the use firstly of an artificial gravitational field and secondly a natural gravitational field while periodically removing sediments after interrupting the supply of the liquid to be purified.

3,594,316

APPARATUS FOR STORING AND FEEDING FRACTIONS OF A STREAM OF LIQUID FLOWING INTO AND OUT OF A REACTOR OR A PROCESS EXCHANGE APPARATUS

Alfons Mersmann, Ranzel, Sandor Vajna, Rheinbreitbach, and Hans Epler, Ranzel, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

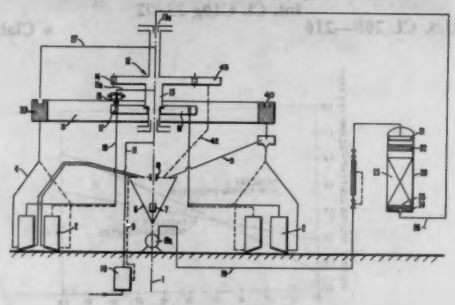
Filed Aug. 30, 1968, Ser. No. 756,648

Claims priority, application Germany, Sept. 1, 1967, D 53,993

Int. Cl. B01d *33/38, 15/04*

U.S. Cl. 210—101 **27 Claims**

The present disclosure is directed to an apparatus for storing, feeding and conveying a liquid fraction which comprises a plurality of pressure-resistant, gas-tight storage tanks, distributor channel means disposed above said storage tanks and divided into a number of compartments corresponding to the number of said storage tanks, a distributing system containing a first liquid feed line associated therewith for introducing the liquid fraction into said compartments, second liquid feed line means for providing communication between each compartment and a storage tank, reservoir means associated with the storage tanks, exhaust line means providing communication between each of the storage tanks and the reservoir means, measuring means disposed in the reservoir means for measuring a predetermined minimum level in said reservoir, gas feed line means providing communication between the storage tanks and a source of pressurized gas, switch means in operative engagement with the measuring



means and said source of gas pressure for supplying a pressurized gas through said gas feed line means to the storage tanks in response to a signal received from said measuring means so that the storage tanks can be filled with the liquid fraction and/or drained of the liquid fraction as necessary, means for removing the liquid fraction from the reservoir means and introducing it into a reactor means, and means for removing the liquid fraction from the reactor and introducing it into the distributing system for reintroduction by said first liquid feed line means into the distributor channel.

3,594,317

WELL DRILLING METHOD USING DECANOL IN PLACE OF OIL IN AQUEOUS DRILLING FLUIDS

Jack C. Estes and Arthur Park, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

No Drawing. Filed Nov. 12, 1969, Ser. No. 876,115

Int. Cl. C01m *3/16*

U.S. Cl. 252—8.5C **9 Claims**

Normal, primary decanol is used in water-based, clay-containing drilling fluids as a replacement for oil to decrease friction of the drill string and flowing drilling fluid and to reduce the tendency of the drill pipe to stick to the well wall due to higher pressures in the well than in the formation. Preferably, the alcohol is pure, synthetic decanol. It can be used as blends with other liquids such as other alcohols.

3,594,318

ANTIOXIDANT COMPOSITIONS

James D. O'Neill, Southfield, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed May 12, 1969, Ser. No. 823,971

Int. Cl. C10m *1/12, 1/38*

U.S. Cl. 252—46.4 **10 Claims**

Organic material is synergistically stabilized by addition of both an α-alkoxy dihydrocarbyl cresol and a dialkyl tin sulfide synergist. For example, lubricating oil containing α-alkoxy-2,6-di-tert-butyl-p-cresol and dibutyl tin sulfide is exceptionally stable.

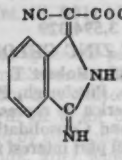
3,594,319

ADDITIVES FOR FUEL ANTIOXIDANTS AND FOR LUBRICANTS

Heinrich Vollmann, Leverkusen, Heinrich Leister, Cologne-Stammheim, and Walther Lohmar, Bergisch-Gladbach, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,788
Claims priority, application Germany, Jan. 29, 1968, P 16 44 897.8
Int. Cl. C10m *1/32*; C10l *1/22*
U.S. Cl. 252—51.5A 6 Claims

Additives to lubricants and fuel antioxidants, consisting of or containing isoindoline compounds of the formula



in which R stands for an alkyl, isoalkyl or alkenyl radical with 7 to 20 carbon atoms.

3,594,320

HYDROCRACKED LUBRICANTS

Bernard A. Orkin, Cherry Hill, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Feb. 19, 1968, Ser. No. 706,632
Int. Cl. C10m *1/18*
U.S. Cl. 252—59 7 Claims

Hydrocracked lubricating oils when treated with an organic peroxide in the presence of a synthetic hydrocarbon lubricant or ester lubricant or additive containing abstractable hydrogen atoms produces products having improved viscosity properties and oxidation stability.

3,594,321

PIEZOELECTRIC CERAMIC

Tomeji Ohno, Masao Takahashi, and Tsuneo Akashi, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan

Filed Nov. 3, 1969, Ser. No. 873,233
Claims priority, application Japan, Nov. 5, 1968, 43/81,194
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 1 Claim

Piezoelectric ceramics are provided in solid solution of the quaternary system

$$Pb(Mn_{1/3}Nb_{2/3})O_3—Pb(Ni_{1/3}Nb_{2/3})O_3 —PbTiO_3—PbZrO_3$$

the ceramic compositions being expressed by the general empirical formula

$$[\{Pb(Mn_{1/3}Nb_{2/3})O_3\}_u\{Pb(Ni_{1/3}Nb_{2/3})O_3\}_{1-u}]_x[PbTiO_3]_y[PbZrO_3]_z$$

wherein the subscripts u, x, y and z denote respectively mol fractions of the respective members and have the following values

$$0.00<u<1.00$$

$$x+y+z=1$$

ERRATA

For Classes 252—83, 252—187 see: Patent Nos. 3,594,578, 3,594,580

3,594,322

LIQUID DETERGENT

James H. Wilson, Demarest, N.J., assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 449,862, Apr. 21, 1965. This application Nov. 6, 1967, Ser. No. 680,946
Int. Cl. C11d *9/48, 1/18*
U.S. Cl. 252—106 9 Claims

Stable germicidal compositions containing, in dissolved form, certain relatively insoluble halogenated organic germicides and methods for the preparation of such compositions are disclosed. The specific germicides are polybromosalicylanilides and trichlorocarbanilide. These germicides are predissolved in specific alkaline solvents or solvent systems which include fatty acid alkanolamides, anionic surfactant solutions, and nonionic surfactant solutions.

3,594,323

TRIETHANOLAMINE STRAIGHT CHAIN SECONDARY ALKYLBENZENE SULFONATE LIQUID DETERGENT COMPOSITIONS

Robert C. Taylor, King of Prussia, and William K. Griesinger, Haverford, Pa., assignors to The Atlantic Refining Company, Philadelphia, Pa.

No Drawing. Filed Mar. 5, 1965, Ser. No. 437,580
Int. Cl. C11d *7/12, 3/04, 3/06*
U.S. Cl. 252—137 10 Claims

A non-gelling aqueous solution consisting essentially of an amount in excess of about 40 weight percent and ranging up to about 70 weight percent of triethanolamine straight chain secondary alkylbenzene sulfonates and a degelling agent in amounts ranging from minimum amounts sufficient to prevent the gelling of said sulfonates to maximum amounts sufficient to produce clear, free-flowing solutions of said sulfonates.

3,594,324

DETERGENT COMPOSITION CONTAINING A SYNERGISTIC COMBINATION OF EMC AND GELATIN AS SOIL SUSPENSION AGENTS

Thomas J. Sayers, Dobbs Ferry, and Edward N. Walsh, New City, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed May 24, 1968, Ser. No. 731,742
Int. Cl. C11d *3/22, 3/065, 7/46*
U.S. Cl. 252—137 1 Claim

A built detergent composition of the nitrilotriacetic acid type characterized by improved soil anti-redeposition comprising a synthetic detergent, a builder of a polyphosphate builder salt in combination with sodium nitrilotriacetate and as a soil anti-redeposition agent, the combination of carboxymethylcellulose and a gelatin protein.

3,594,325

AGGLOMERATED ENZYME PRODUCTS

Harold E. Feierstein, Creve Coeur, Raymond L. Liss, Warson Woods, and Noel L. Schomburg, Florissant, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 25, 1968, Ser. No. 724,269
Int. Cl. C11d *3/065*
U.S. Cl. 252—138 11 Claims

The present invention relates to stable enzyme products composed of a mixture of enzymically active materials and a resinous binding agent. Said products are useful in detergents and are prepared by a novel agglomeration process.

3,594,326

METHOD OF MAKING MICROSCOPIC CAPSULES

Rene Karl Himmel, Kilchberg, Switzerland, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Continuation of application Ser. No. 415,809, Dec. 3, 1964. This application Feb. 14, 1969, Ser. No. 802,731

Int. Cl. B01j *13/02*; A61k *9/04*; B44d *1/02*

U.S. Cl. 252—316 2 Claims

The process of forming minute capsules en masse which comprises (a) establishing an agitated system consisting of a liquid polar vehicle constituting a continuous first phase, a second phae dispersed therein consisting of minute mobile entities of core material, and a third phase dispersed therein consisting of minute, mobile liquid entities of a wall-forming soltuion of a non-polar polymeric material, the said core material being wettable by said wall-forming solution, the said three phases being mutually incompatible, the third phase constituting such a part of the total three-phase system, by volume that it can exist as a dispersed phase of minute mobile entities capable of and sufficient in amount to deposit around the core entities, and wherein the wall-forming polymeric material has a decreasing solubility with increasing temperature in the vehicle, and wherein the third phase is maintained as such, at least in part, by the presence of a polyelectrolyte polymer (b) hardening the walls so formed by elevating the temperature of the system to a temperature above the gel point of the wall-forming polymer, and (c) separating the hardened capsules from the rest of the system at a temperature above that at which resolution of the capsule walls takes place to any substantial degree.

3,594,327

PROCESS FOR MAKING MINUTE CAPSULES AND CAPSULE PRODUCT

Julius G. Becsey, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Continuation of abandoned application Ser. No. 622,369, Mar. 10, 1967, which is a continuation of abandoned application Ser. No. 151,449, Nov. 10, 1961. This application Mar. 28, 1969, Ser. No. 837,967

Int. Cl. B01j *13/02*; B44d *1/02*, *1/44*

U.S. Cl. 252—316 9 Claims

A process for making minute capsules in which minute particles of water-immiscible material, such as iron oxide, and hydrophilic, film-forming polymeric material, such as gelatin, are dispersed in water; coacervation is induced which causes the polymeric material to deposit on each of the minute particles as a liquid wall; and a metallic chelating salt, such as chromic chloride or copper sulfate, is added to harden and water-insolubilize the liquid deposit to produce the minute, rigid-walled capsules.

3,594,328

PROCESS FOR THE ENCAPSULATION OF DISPERSIBLE MATERIALS

Luzius Schibler, Riehen, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Continuation of application Ser. No. 564,543, July 12, 1966. This application Dec. 9, 1969, Ser. No. 880,476

Claims priority, application Switzerland, Aug. 2, 1965, 10,861/65

Int. Cl. B01j *13/02*; B44d *1/02*

U.S. Cl. 252—316 5 Claims

An encapsulation process is provided wherein the substance to be encapsulated is dispersed in a liquid with which it is substantially immiscible in the presence of a tenside capable of forming a compound that is insoluble in the dispersing liquid and thereafter the tenside in the dispersion, which is in association with the substance, is converted into the irreversibly insoluble state to encapsulate the substance. Particularly suitable as tensides are the surface-active, cross-linkable aminoplasts, preferably surface-active, etherified methylolmelamines or the corresponding methylolureas.

ERRATUM

For Class 252—327 see:
Patent No. 3,594,393

3,594,329

REGENERATION OF ZINC CHLORIDE CATALYST

Everett Gorin, Pittsburgh, Robert T. Struck, Bridgeville, and Clyde W. Zielke, Pittsburgh, Pa., assignors to the United States of America as represented by the Secretary of the Interior and Consolidation Coal Company, Library, Pa., fractional part interest to each

Filed July 23, 1969, Ser. No. 844,201

Int. Cl. B01j *11/80*, *11/04*

U.S. Cl. 252—417 5 Claims

Spent zinc chloride catalyst is regenerated by combustion in the vapor phase in the presence of a fluidized refractory solid such as silica sand. Use of a near-stoichiometric amount of air results in substantially complete removal of sulfur, nitrogen and carbon impurities, while use of about 40 to 60% of the stoichiometric amount of air results in production of a low-sulfur fuel gas.

3,594,330

PROCESS FOR THE POLYMERIZATION OF α-OLEFINS

André Delbouille and Henri Toussaint, Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

No Drawing. Filed Aug. 29, 1968, Ser. No. 756,330

Claims priority, application France, Aug. 31, 1967, 119,563

Int. Cl. C08f *3/02*

U.S. Cl. 252—429 10 Claims

Polymerization of α-olefins is carried out in the presence of a solid catalyst which is composed of an organic compound of a metal of Groups I to III of the Periodic Table and a crystalline halide of a reduced metal of Groups IV–*b*, V–*b* or VI–*b* of the Periodic Table deposited on a pulverulent support. The reduced metal halide is obtained by reducing a halide of the metal at its maximum valence with an organometallic compound at a temperature below 0° C. and in the absence of liquid diluent. Catalysts prepared in this manner have a high stereospecificity and catalytic activity, and polymerization carried out in the presence thereof yields highly isotactic crystalline polymer.

3,594,331

METHOD OF INCREASING THE THERMAL STABILITY OF CRYSTALLINE ZEOLITES

Curtis H. Elliott, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,117

Int. Cl. B01j *11/78*

U.S. Cl. 252—442 12 Claims

Methods of increasing the thermal stability of crystalline zeolites are disclosed. The methods are characterized

by the steps of treating the crystalline zeolite with a dilute solution of a fluorine compound whereby a very small amount of fluoride is incorporated in the zeolite.

3,594,332

SPHERICAL PARTICLES OF HYDROXIDE AND METHOD

Max Michel, Yerres, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

No Drawing. Filed July 2, 1968, Ser. No. 741,873

Claims priority, application France, July 4, 1967, 112,982; Mar. 1, 1968, 142,059

Int. Cl. B01j *11/44*

U.S. Cl. 252—448 **8 Claims**

The preparation of spherical particles of oxides characterized by high mechanical solidity in which at least two oxides are present in a concentration of 2 moles per liter and in the form of a sol or peptized suspension, mixed and flocculated by addition thereto of a base to raise the pH of the mixture, after which the flocculated mixture is worked to form a suspension of spherical particles which are washed, dried and, if desired, calcined at elevated temperatures.

3,594,333

FORMYLATED AROMATIC POLYMERS AND METHOD OF MAKING SAME

David R. Buss, Kalamazoo, Mich., and Theodore Vermeulen, Berkeley, Calif., assignors to The Regents of the University of California

No Drawing. Filed July 26, 1967, Ser. No. 656,000

Int. Cl. C08f *27/00;* **C08j** *1/30*

U.S. Cl. 260—2.5 **18 Claims**

Crosslinked, formylated, swellable aromatic-containing polymers prepared by swelling a preexisting crosslinked polymer with an inert organic solvent, reacting the polymer with a dihalomethyl alkyl ether in the presence of a mild Friedel-Crafts catalyst and hydrolyzing the reaction product. The resulting formylated polymer retains its swelling characteristics and is useful as an intermediate in the synthesis of optically active amine-containing sorbents.

3,594,334

SURFACTANT MIXTURES FOR FLEXIBLE POLYESTER URETHANE FOAMS

Lawrence Marlin, Yorktown Heights, N.Y., assignor to Union Carbide Corporation

No Drawing. Continuation-in-part of abandoned application Ser. No. 493,529, Oct. 6, 1965. This application Dec. 7, 1967, Ser. No. 688,702

Int. Cl. B01f *17/54;* **C08g** *22/46*

U.S. Cl. 260—2.5 **19 Claims**

This invention relates to the use of novel combinations of foam stabilizing surfactants in the production of flexible polyester urethane foams. The novel foam stabilizer combinations consist of (a) an anionic organic surfactant that is soluble in the polyester reactant at room temperature and that is capable of lowering the surface tension of the polyester resin reactant when dissolved therein and, (b) a siloxane-polyoxyalkylene block copolymer surfactant that has a critical molecular weight, siloxane content and oxyethylene content. The novel surfactant combinations allow for the production of flexible polyester urethane foams having fine, uniform cell structure, low compression set and freedom from large voids and splits.

3,594,335

SHAPED BODIES OF BONDED RIGID POLYURETHANE FOAM PARTICLES

Gerald A. Schultz, Newfan, and Walter E. Voisinet, Colden, N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

No Drawing. Original application Jan. 3, 1966, Ser. No. 518,032. Divided and this application June 12, 1969, Ser. No. 840,895

Int. Cl. B32b *27/18;* **C08g** *41/00*

U.S. Cl. 260—2.5 **3 Claims**

Integral shaped articles are made of comminuted rigid polyurethane foam particles bonded together by the products of the reaction between organic isocyanates and water. The organic isocyanates may be modified with a high melting thermoplastic resin which is reactive with the isocyanates and/or inert inorganic fillers.

3,594,336

PROCESS FOR THE PREPARATION OF AQUEOUS POLYMERIZATE DISPERSIONS OF UNSATURATED MONOMERS

Eduard Bergmeister and Hubert Wiest, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

No Drawing. Filed May 8, 1968, Ser. No. 727,693

Claims priority, application Germany, Sept. 20, 1967, W 44,815

Int. Cl. C08f *15/20*

U.S. Cl. 260—17R **3 Claims**

The invention relates to a process for the preparation of aqueous polymerizate dispersions which comprises the steps of effecting a dispersion polymerization of free-radical polymerizable organic compounds in the presence of 0.6% to 4% by weight of the polymerizates of N-vinylpyrrolidone, 0.1% to 8% by weight of non-ionic emulsifiers and from 0% to 1% by weight of anionic emulsifiers characterized in that about 0.1% to about 0.8% by weight of a water-soluble hydroxyalkyl cellulose is additionally present in the polymerization recipe, where all the above percentages are percentages by weight with reference to the weight of the free-radical polymerizable organic compounds present in the polymerization recipe.

3,594,337

SYNTHETIC LATICES AND USE THEREOF

Joseph L. Shea, Short Hills, N.J., assignor to Celanese Corporation

No Drawing. Filed Apr. 15, 1966, Ser. No. 542,720

Int. Cl. C08f *29/50*

U.S. Cl. 260—17.4 **14 Claims**

A latex blend of a tripolymer of vinyl acetate, N-alkylol acrylamide, and ethyl acrylate with a tetrapolymer of methyl acrylate, ethyl acrylate, N-alkylolacrylamide, and unsaturated monocarboxylic or discarboxylic acid or anhydride provides, on application and heat curing, is an effective adhesive, especially for use in non-woven fabrics.

3,594,338

NITROCELLULOSE LACQUERS CONTAINING ETHYLENE/VINYL ESTER/CARBOXYLIC ACID COPOLYMERS

George L. K. Hoh and Donald E. Tuites, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 2, 1968, Ser. No. 726,242

Int. Cl. C09d *3/16, 3/74*

U.S. Cl. 260—17 **6 Claims**

An organic solvent-containing lacquer composition is disclosed which contains, as solid ingredients, nitrocellu-

lose, an ethylene/vinyl acetate/acrylic or methacrylic acid copolymer, and, optionally, a modifying resin (sucrose acetate isobutyrate). The particular copolymer contains at least 35 weight percent vinyl acetate and at least 0.5 weight percent acid. The lacquers are particularly suitable for coating metal substrates where enhanced flexibility and adhesion are required.

3,594,339

USE OF OXIDES OF MANGANESE IN ELECTRODEPOSITABLE COMPOSITIONS

Thomas Palaika, Arnold, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 791,129, Jan. 14, 1969. This application Nov. 3, 1969, Ser. No. 873,518

Int. Cl. C08g *51/04*

U.S. Cl. 260—18 **13 Claims**

This invention relates to novel, pigmented electrodepositable compositions. More particularly, this invention relates to the use of oxides of manganese to produce black or dark-colored electrodepositable compositions, and which in some cases also produce a drying effect in the deposited film. Said films do not exhibit the pigskinning effect observed when carbon black pigments are used.

3,594,340

EPOXY RESIN ESTERS AND PROCESS OF PREPARATION

Samuel D. Hollis, Pleasant Hills, Pa., and Philip E. Winston, Jr., Union, N.J., assignors to Pennsylvania Industrial Chemical Corporation

No Drawing. Filed June 24, 1968, Ser. No. 739,189

Int. Cl. C08g *30/10*

U.S. Cl. 260—18EP **11 Claims**

Terpene epoxy resin ester solution which is non-photochemically reactive and a process for preparing such a solution by polymerizing a mixture of liquid epoxy resin and a terpene phenolic compound dissolved in a hydrocarbon solvent and thereafter esterifying the product with a monocarboxylic acid.

3,594,341

TREATING OF AGGLOMERATES OF CELLULOSE PARTICLES AND FIBRES

Hynek Bata, 25 Rue Saint-Didier, Paris, 6 eme, France; Pierre Bernard, 5 Parc de l'Iton; and Bernard Costemalle, Tour n°3, Place Colbert, both of Mont-Saint-Aignan, Seine-Maritime, France; and Robert Michelet, 6 Square de Versailles, Les Grandes Terres, Marly-le-Roi, Seine-et-Oise, France

No Drawing. Filed Aug. 16, 1966, Ser. No. 572,669

Int. Cl. C08g *51/52;* **C08f** *45/52*

U.S. Cl. 260—28 **3 Claims**

An aqueous emulsion of a mixture of paraffin and a petroleum resin, to which a resin adhesive is added, is useful for treating agglomerates such as cellulose fibres or wood particles to form products such as chip boards and fibre boards.

3,594,342

PROCESS FOR THE INTRODUCTION OF ADDITIVES INTO PLASTIC AND WAX MELTS

Manfred Ratzsch, Leuna, and Rolf Kilian, Bad Durrenberg, Germany, assignors to VEB Leuna-Werke Walter Ulbricht, Leuna, Germany

No Drawing. Filed Sept. 22, 1967, Ser. No. 669,681

Int. Cl. C08f *11/70*

U.S. Cl. 260—28.5 **8 Claims**

Process for the introduction of additives into plastic and wax melts by means of a concentrated solution or dispersion of said additives wherein as solvents or dispersants molten copolymers of ethylene with vinyl acetate or with acrylic esters of a mean molecular weight ranging from 1200 to 8000 are used.

3,594,343

PHENOLIC-UREA HOT BOX RESIN SYSTEM

Rodney M. Huck, Longmeadow, and Joel M. Schnur, Agawam, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 12, 1967, Ser. No. 667,059

Int. Cl. C08g *51/04, 51/26*

U.S. Cl. 260—29.3 **2 Claims**

A liquid phenolic-urea resin and catalyst system which has improved bench life and low formaldehyde evolution during thermosetting. The system is especially useful in foundries for the production of sand cores at an extremely rapid rate.

3,594,344

STABLE AQUEOUS EMULSIONS OF ALKYL ACRYLATE-GLYCIDYL METHACRYLATE ENGRAFTED N-VINYL

Eugene S. Barabas, Watchung, and Frederick Grosser, Midland Park, N.J., assignors to GAF Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 595,027, Nov. 17, 1966. This application May 22, 1969, Ser. No. 827,040

Int. Cl. C08f *7/14*

U.S. Cl. 260—29.6 **10 Claims**

Water-insoluble grafted terpolymers of a polymeric N-vinyl lactam, such as polyvinyl pyrrolidone, with an alkyl acrylate and glycidyl methacrylate, are prepared as stable aqueous emulsions.

3,594,345

FIBER GLASS LAMINATES CONTAINING FURFURYL RESIN BINDER

Lloyd H. Brown, Crystal Lake, and David D. Watson, Barrington, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed May 31, 1968, Ser. No. 733,282

Int. Cl. C08f *27/18;* **C08g** *51/10*

U.S. Cl. 260—37 **4 Claims**

Glass fibers are bound with a furfuryl alcohol-formaldehyde resin in a binder containing furfural, a high catalyst level, and a silane. The resulting article is cured at temperatures below 100° C.

3,594,346

POLYAMIDES STABILISED AGAINST DEGRADATION BY LIGHT

Karl Heinz Hermann, Krefeld-Bockum, August Bockmann, Krefeld, Hans Rudolph, Krefeld-Bockum, and Walter Bockmann, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

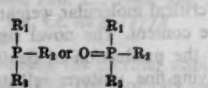
No Drawing. Filed May 24, 1968, Ser. No. 731,716

Claims priority, application Germany, June 9, 1967, F 52,642

Int. Cl. C08g *51/62*

U.S. Cl. 260—45.75 **5 Claims**

Polyamides, stabilized against degradation by light, containing a combination of manganese compounds and phosphorous compounds of the general formula



wherein R_1, R_2, and R_3, which may be different or not, represent alkyl, cycloalkyl, aralkyl, aryl, alkoxy, cycloalkoxy, aralkoxy or aryloxy radicals.

3,594,347

POLYESTERS CONTAINING ARYL PHOSPHINATES

Stanley D. Lazarus, Petersburg, and Ian C. Twilley, Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 5, 1968, Ser. No. 757,770

Int. Cl. C08g *17/04, 51/58*

U.S. Cl. 260—45.75 24 Claims

Linear, fiber-forming polyesters of reduced color and resistant to yellowing caused by actinic or thermal degradation are prepared by providing a small but effective amount of certain aryl phosphinic acids or salts thereof in the polyester.

3,594,348

POLYETHERS CAPABLE OF BEING CROSS-LINKED UNDER THE ACTION OF LIGHT AND PROCESS FOR THEIR MANUFACTURE

Herbert Maar and Hartmut Steppan, Wiesbaden, Günter Messwarb, Kelkheim, Taunus, and Walter Lüders, Neu-Isenburg, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed July 2, 1968, Ser. No. 741,877

Claims priority, application Germany, July 6, 1967, F 52,874

The portion of the term of the patent subsequent to Mar. 10, 1987, has been disclaimed

Int. Cl. C08g *23/04;* G03c *1/68, 5/00*

U.S. Cl. 260—47 20 Claims

Polyethers capable of being cross-linked under the action of light are made by cationic polymerization of light-sensitive oxetanes disubstituted in the 3-position, if desired together with substituted oxiranes, oxetanes or oxolanes as light-insensitive comonomers.

3,594,349

SUBSTITUTED POLYMERIC as-TRIAZINES

Billy M. Culbertson, Burnsville, Minn., assignor to Ashland Oil & Refining Company, Ashland, Ky.

No Drawing. Original application Nov. 8, 1966, Ser. No. 592,743, now Patent No. 3,498,981, dated Mar. 3, 1970. Divided and this application May 27, 1969, Ser. No. 828,354

Int. Cl. C08g *9/04, 9/06*

U.S. Cl. 260—72 1 Claim

Novel substituted polymeric as-triazines have been prepared by the reaction of a difunctional hydrazidine with a difunctional substituted glyoxal. The compositions are thermally stable and can be employed as coatings.

3,594,350

ESTERIFICATION OF TEREPHTHALIC ACID WITH AN ALKYLENE GLYCOL IN THE PRESENCE OF AMMONIA OR AN AMMONIUM SALT OF A DIBASIC CARBOXYLIC ACID

Robert A. Lofquist, Richmond, and Lamberto Crescentini and Laszlo J. Balint, Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 6, 1969, Ser. No. 864,181

Int. Cl. C08g *17/013;* C07c *69/82*

U.S. Cl. 260—75 12 Claims

The esterification of polycarboxylic acid with an alkylene glycol is described under conditions of direct esterification wherein the polycarboxylic acid is esterified with an alkylene glycol in the presence of ammonia or an ammonium salt of a dibasic carboxylic acid.

3,594,351

PROCESS FOR PRODUCING A BLOCK COPOLYMER OF α-AMINO ACID-N-CARBOXY ANHYDRIDE AND AN ISOCYANATE AND A PROCESS FOR PRODUCING SYNTHETIC LEATHER BY THE USE THEREOF

Shinzi Uchida and Yasuo Sone, Hitachi-shi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

No Drawing. Filed Mar. 26, 1968, Ser. No. 715,952

Claims priority, application Japan, Apr. 10, 1967, 42/22,419, 42/22,422

Int. Cl. C08g *22/04*

U.S. Cl. 260—77.5 10 Claims

(1) A process for producing a synthetic resin (C) and a process for producing a synthetic leather by use of said synthetic resin (C), wherein the synthetic resin (C) is produced by the process which comprises:

(I) Reacting an amine having at least two active hydrogen atoms with a urethane pre-polymer having isocyanate groups at the terminals thereof in an equivalent less than an equivalent of the amine to produce a compound (A) having amino groups at the terminals thereof;

(II) Reacting compound (A) with an anhydride of N-carboxy-alpha-amino acid to produce compound (B), a compound having amino groups at the terminals thereof; and

(III) Reacting compound (B) with additional urethane pre-polymer, said urethane pre-polymer having isocyanate groups at the terminals thereof, to produce synthetic resin (C).

(2) A process for producing a synthetic resin (C′) and a process for producing a synthetic leather by use of said synthetic resin (C′), wherein the synthetic resin (C′) is produced by the process which comprises:

(I) Reacting an amine having at least two active hydrogen atoms with an anhydride of N-carboxyl-alpha-amino acid to produce a compound (A′) having amino groups at the terminals thereof; and

(II) Reacting compound (A′) with a urethane pre-polymer, said urethane pre-polymer having isocyanate groups at the terminals thereof to produce synthetic resin (C′).

3,594,352

POLYURETHANE ELASTOMER COMPOSITIONS PREPARED FROM POLYARYLPOLYISOCYANATES AND HIGH MOLECULAR WEIGHT POLYETHER POLYOLS

Rodney Frederick Lloyd and George Phillip Speranza, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed Oct. 1, 1968, Ser. No. 764,318

Int. Cl. C08g *22/06*

U.S. Cl. 260—77.5 5 Claims

Polyurethane elastomer compositions are prepared by reacting in a one-shot process polyarylisocyanates having a functionality greater than 2.0 with polyether polyols having functionalities from 3 to 6 and molecular weight of about 5,000 to 13,000. The elastomer compositions are characterized by ambient temperature curing and physical properties of good elongation, tear strength, tensile strength and compression load deflection properties and low compression set values. These elastomers are useful as sealants, gaskets and surface coatings.

3,594,353

NOVEL ESTER POLYMERS

Elemer Domba, Olympia Fields, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 732,505, May 28, 1968, which is a continuation-in-part of application Ser. No. 494,872, May 28, 1965. This application Aug. 6, 1969, Ser. No. 848,120

Int. Cl. C08f *3/50, 15/16*

U.S. Cl. 260—78.4 4 Claims

New and useful ethylenically unsaturated fluorinated polymers used in sizing fabrics to impart both repellency to water and resistance to absorption and soiling by oily and greasy material.

3,594,354

METHOD OF INCREASING THE CURING RATE OF MONOEPOXIDE-CONTAINING COMPOSITIONS

Stanley M. Hazen, Cheswick, and William J. Heilman, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Jan. 2, 1968, Ser. No. 694,842

Int. Cl. C08f *47/00*

U.S. Cl. 260—78.5 11 Claims

A method is provided for increasing the rate of curing of a liquid coating and molding composition to form an infusible resinous article or coating. The composition comprises a solution of a polymerizable olefinically unsaturated monooxirane compound such as glycidyl methacrylate, a solid polyanhydride having at least three succinic anhydride groups (excluding aromatic anhydrides in which the alpha carbon atoms of the anhydride group are included in the aromatic ring), for example, the copolymer of a straight chain alpha-monoolefin and a maleic anhydride; and certain olefinically unsaturated monomers free of oxirane oxygen atoms, such as styrene or acrylonitrile. The rate of curing of this composition can be increased by adding to the above described composition a small amount of water on the order of 0.5 weight percent. The water is effective for increasing the rate of curing for the above composition whether the composition is cured thermally, with the use of a free radical catalyst such as an organic peroxide, for example benzoyl peroxide, with a soluble tertiary amine such as 3-picoline, or with a combination of heat, organic peroxides and tertiary amines.

3,594,355

WATER-SOLUBLE ISOTHIURONIUM SALTS OF EPIHALOHYDRIN POLYMERS

Edwin J. Vandenberg and William D. Willis, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Oct. 29, 1969, Ser. No. 872,344

Int. Cl. C08g *23/00*

U.S. Cl. 260—79R 9 Claims

Water-soluble isothiuronium salts of epihalohydrin homopolymers or copolymers with one another or with ethylene oxide are described which are highly useful as shrinkproofing agents for wool, as flocculating agents and as paper additives for increasing both wet and dry strength. These isothiuronium salts can be prepared in solution whereupon only about 5% of the halo groups need be converted to isothiuronium groups to obtain water-solubility of the product or they can be prepared in the substantial absence of a solvent whereupon about 50% of the halo groups need to be converted to obtain water-solubility of the product.

3,594,356

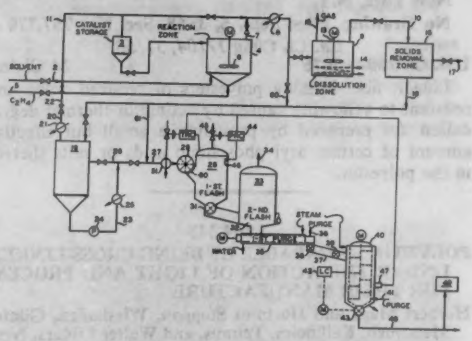
POLYMER RECOVERY PROCESS AND APPARATUS

Robert A. Hinton, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Apr. 24, 1967, Ser. No. 633,227

Int. Cl. C08f *1/88, 1/98*

U.S. Cl. 260—88.2 10 Claims



Bulk density of polymer recovered from a solution thereof in a solvent is controlled by removing the polymer from solvent in a flashing operation wherein the flash zone is held at an elevated pressure, said pressure being sufficiently high to densify the polymer but not so high as to restrict the flashing of solvent from the solution. The initial solvent removal is thus achieved by flashing the solution consisting essentially of polymer and solvent in a flash-comminution zone having a pressure maintained therein in the range of 16 to 50 p.s.i.a., thereafter passing the resulting solid sized polymer particles to a lower pressure solvent removal zone and finally purging the resulting essentially solvent-free material in two or more zones to provide substantially solvent-free polymer. Pressure in the initial flash-comminution zone is controlled responsive to the measured value of the bulk density of the polymer in the purge zone.

3,594,357

POLYMERIZATION OF VINYL COMPOUNDS WITH SELECTED BORON-NITROGEN COMPOUNDS

Anestis L. Logothetis, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 546,615, May 2, 1966. This application June 24, 1968, Ser. No. 739,151

Int. Cl. C08f *1/74, 1/76*

U.S. Cl. 260—88.2 25 Claims

Described is a process for the homo- and copolymerization of ethylene which employs an initiating system comprising the following two components or the reaction products thereof:

(1) A borane component consisting of one or more of the boranes of the formulas

B_2H_6
RBH_2BH_2R
R_2BHBHR_2
R'_3B
$R'_3N \cdot BH_3$
$R'_2NH \cdot BH_3$ and
$R''_3P \cdot BH_3$

wherein

R is an alkyl group of 1–9 carbon atoms, R' is an alkyl group of 1–12 carbon atoms, and R'' is an alkyl, aryl or alkaryl group, each of up to 12 carbon atoms; and

(2) A stable free radical or free radical precursor component which may be one of

nitric oxide
a 1,1-diaryl-2-(polynitrophenyl)hydrazyl
an N-nitrosodiarylamine
a nitrosoarene
a tetraarylhydrazine
a nitroxide
a tertiary alkyl nitrite
a selected nitrite salt
the ammonium salt of N-nitrosophenylhydroxylamine and
a poly (tert-alkyl)phenoxy.

3,594,358

CATALYST COMPOSITION, PROCESS OF PREPARATION, AND POLYMERIZATION PROCESS AND PRODUCT

Charles W. Moberly, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Continuation-in-part of application Ser. No. 401,689, Oct. 5, 1964. This application Sept. 28, 1967, Ser. No. 671,240
Int. Cl. C08f *3/30, 29/00, 33/00*
U.S. Cl. 260—92.8 7 Claims

A preformed stable free radical catalyst is formed by impregnating a free radical precursor on solid particles of a polymer of at least one vinyl monomer. The preformed catalyst can be utilized to polymerize substituted vinyl monomers. The polymer production rate and the yield in vapor phase polymerization is increased by incorporating a small amount of a hydrocarbon selected from the group consisting of alkanes, cycloalkanes and aromatics.

3,594,359

METHOD OF POLYMERIZING VINYL CHLORIDE

Anatoly Mikhailovich Sharetsky, Ulitsa Pirogova 14, kv. 15; Stanislav Vladimirovich Svetozarsky, Prospekt Pobedy 8-a, kv. 15; Ekhiel Naumovich Zilberman, Prospekt Dzerzhinskogo 10, kv. 3; and Isaak Elya-Berkovich Kotlyar, Ulitsa Kljukvina 11-a, kv. 42, all of Dzerzhinsk, U.S.S.R.

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,123
Int. Cl. C08f *1/11, 3/30, 11/62*
U.S. Cl. 260—92.8 4 Claims

Vinyl chloride is polymerized in an aqueous medium at 0° to 25° C. using a novel redox system consisting of lauroyl peroxide and ferrous hydroxide, using sodium styrene-maleate, polyvinyl alcohol or methyl cellulose as the dispersing agent, chloroform or trichloroethylene as the molecular weight regulator and triethylamine as the polymerization inhibitor.

3,594,360

QUATERNARY CATALYST SYSTEM FOR BUTADIENE POLYMERIZATION

Rudolf H. Gaeth, Lake Jackson, Tex., assignor to Phillips Petroleum Company

No Drawing. Filed May 29, 1969, Ser. No. 829,108
Int. Cl. C08d *3/06*
U.S. Cl. 260—94.3 8 Claims

A polybutadiene composition possessing broad molecular weight distribution and easily controllable microstructure varying from a high cis to a high vinyl configuration is fashioned in a single direct polymerization system by employing a novel catalyst containing a nickel compound, lithium aluminum hydride or an organometallic compound, a fluoride compound, and a molybdenum compound.

3,594,361

1,2-POLYBUTADIENE COMPOSITIONS

Chester L. Parris, Morris Plains, and Leo S. Rieve, Schooley's Mountain, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 23, 1969, Ser. No. 860,406
Int. Cl. C08d *3/06*
U.S. Cl. 260—94.3 5 Claims

Polybutadiene compositions of melting point 50°–100° C. with the major proportion of the butadiene content being combined in the 1,2 form. The co-ingredient is rubbery, amorphous butadiene polymer having vinyl double bonds and internal double bonds. The process of making employs as catalyst a complex of a cobalt compound with butadiene or open chain butadiene dimer and with an organo metallic compound of zinc, lithium or aluminum; and a catalyst modifier of fumaric acid ester or maleic acid ester. The copolymers are formulated to molding compounds which can be cured rapidiy and used in transfer molding.

3,594,362

UREA COMPLEXES

Karoly Szabo, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Mar. 17, 1964, Ser. No. 352,637
Int. Cl. C36 *127/14, 16, 18, 20*
U.S. Cl. 260—96.5 19 Claims

This invention relates to chemical complexes of urea or urea derivatives with a completely halogenated acetone and to their preparation. The invention is also concerned with fungicidal and herbicidal compositions containing as the active component thereof at least one of the aforesaid complexes.

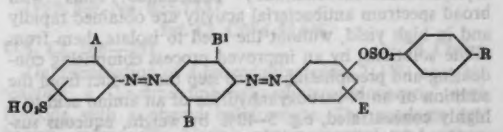
3,594,363

DIAZO DYES FOR NYLON

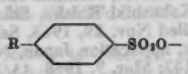
Hans Alfred Stingl, Brookside Heights, Toms River, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

No Drawing. Filed July 10, 1968, Ser. No. 743,630
Int. Cl. D09b *31/12;* D06p *1/02*
U.S. Cl. 260—186 6 Claims

Compounds of the formula



wherein A is hydrogen, lower alkyl such as methyl, ethyl or propyl, lower alkoxy such as methoxy, ethoxy or butoxy, or chlorine; B and B¹ are hydrogen, lower alkyl such as methyl, ethyl or butyl, or lower alkoxy such as methoxy, ethoxy or butoxy; E is hydrogen, lower alkyl such as methyl, ethyl or butyl, or lower alkoxy such as methoxy, ethoxy or butoxy; R is hydrogen, methyl or chlorine and



is either ortho or para to the azo linkage; and SO_3H is either meta or para to the azo linkage, provide yellow to

scarlet shades of good fastness and dyeing properties and excellent leveling characteristics on natural and synthetic polyamide fibers.

3,594,364
5H-1,4-BENZODIAZEPINE-4-OXIDE AND PREPARATION THEREOF

George Francis Field, Nutley, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application Dec. 3, 1964, Ser. No. 415,793, now Patent No. 3,398,139, dated Aug. 20, 1968, which is a continuation-in-part of applications Ser. No. 358,919, Apr. 10, 1964, and Ser. No. 400,193, Sept. 29, 1964. Divided and this application Apr. 9, 1968, Ser. No. 735,479
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 5 Claims

New 5-phenyl-5H-1,4-benzodiazepin 4-oxides and methods for their preparation are described.

3,594,365
3H-1,4-BENZODIAZEPINES AND PREPARATION THEREOF

George Francis Field, Nutley, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application Dec. 3, 1964, Ser. No. 415,793, now Patent No. 3,398,139, dated Aug. 20, 1968, which is a continuation-in-part of application Ser. No. 358,919, Apr. 10, 1964. Divided and this application Apr. 9, 1968, Ser. No. 735,477
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 6 Claims

Novel 5-phenyl-3H-1,4-benzodiazepines and 5-phenyl-3H-1,4-benzodiazepines 4-oxides are described.

3,594,366
PROCESS FOR THE PREPARATION OF AMINOALICYCLIC AND AMINOARYLALICYCLIC PENICILLINS

Norman H. Grant, Wynnewood, Donald E. Clark, Norristown, and Harvey E. Alburn, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation of application Ser. No. 656,668, July 28, 1967. This application Nov. 26, 1968, Ser. No. 779,234
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 5 Claims

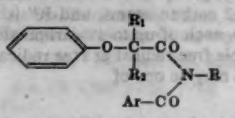
6-(1-aminocycloalkanecarboxamido) and 6-(1-aminoarylcycloalkanecarboxamido) penicillanic acids with broad spectrum antibacterial activity are obtained rapidly and in high yield, without the need to isolate them from dilute solutions, by an improved process comprising condensing and precipitating in one step the product from the addition of an N-carboxyanhydride of an amino acid to a highly concentrated, e.g. 5–40% by weight, aqueous suspension of 6-aminopenicillanic acid.

3,594,367
PROCESS FOR PRODUCTION OF PENICILLIN

Jinnosuke Abe, Tagata-gun, Shizuoka-ken, Tetsuo Watanabe, Tokyo, Teruo Take, Tagata-gun, Shizuoka-ken, Kentaro Fujimoto, Sunto-gun, Shizuoka-ken, Tadashiro Fujii and Masashi Kuramoto, Tagata-gun, Shizuoka-ken, and Sadami Kobari, Mishima-shi, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka-ken, Japan

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,234
Claims priority, application Japan, Nov. 29, 1967, 42/76,142; Mar. 9, 1968, 43/15,278
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 6 Claims

α-Phenoxyalkyl penicillin and salts thereof are produced by reacting 6-aminopenicillanic acid or salts thereof with a novel N,N-diacyl compound of the formula



in which R is alkyl, cycloalkyl, aryl, substituted aryl, aralkyl, substituted aralkyl or phenylalkenyl, Ar is phenyl, phenoxyalkyl, or substituted phenyl, and R_1 and R_2 are hydrogen or lower alkyl.

3,594,368
PREPARATION OF N,N'-DIBENZYLETHYLENEDIAMINE BIS D(—) - α - AMINOBENZYLPENICILLIN TRIHYDRATE

John H. Sellstedt, St. Davids, Delaware, Richard Bogash, Philadelphia, and Joseph P. Hou, Butler Pike, Conshohocken, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 11, 1969, Ser. No. 832,463
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 5 Claims

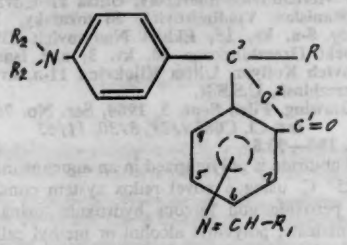
This invention concerns a process for the preparation of crystalline N,N'-dibenzylethylenediamine bis [D(—)-α-aminobenzylpenicillin]trihydrate of high purity and potency having an average particle size in the range of about two to about thirty microns which is useful in the preparation of pharmaceutically elegant antibiotic dosage forms.

3,594,369
3,5(6)-DISUBSTITUTED-3-(PARA-DILOWERALKYLAMINOPHENYL) PHTHALIDES

Chao-Han Lin, Dayton, and Arthur J. Wright, Cincinnati, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Jan. 21, 1969, Ser. No. 792,280
Int. Cl. C07d *5/36*
U.S. Cl. 260—240 11 Claims

A novel chromogenic material of normally colorless form is disclosed, having a structural formula:



wherein R comprises 1,2-dimethylindol-3-yl and p-dialkylaminophenyl radicals; R_1 comprises substituted and unsubstituted aromatic and heterocyclic-aromatic radicals; and R_2 comprises hydrogen and alkyl radicals having less than five carbon atoms; said material assuming a colored form upon reactive contact with a Lewis acid molecule. Examples include

6-(p-dimethylaminobenzylidene)amino-3-(p-dimethylaminophenyl)-3-(1,2-dimethylindol-3-yl)phthalide;
5-(p-dimethylaminobenzylidene)amino-3-(p-dimethylaminophenyl)-3-(1,2-dimethylindol-3-yl)phthalide;
6-(benzylidene)amino-3,3-bis(p-dimethylaminophenyl)phthalide;
5-(p-dimethylaminobenzylidene)amino-3,3-bis(p-dimethylaminophenyl)phthalide;
6-(cinnamylidene)amino-3-(p-dimethylaminophenyl)-3-(1,2-dimethylindol-3-yl)phthalide.

3,594,370

PRODUCTION OF 7-AMINOCEPHALOSPORANIC ACID

Harvey M. Higgins, Jr., Danville, and Thomas W. McIntyre, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 738,083, June 19, 1968. This application May 15, 1969, Ser. No. 825,066

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 6 Claims

In the preparation of 7-aminocephalosporanic acid (7-ACA) by the chemical deacylation of cephalosporin C and salts thereof with nitrosyl chloride and recovery of 7-ACA by the evaporation of the solvents, increased yields are obtained by the addition, prior to the evaporation of the solvents, of a substance that destroys excess nitrosyl chloride and decreases undesirable side reactions.

3,594,371

PREPARATION OF 7-AMINOCEPHALOSPORANIC ACID

Thomas W. McIntyre, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of applications Ser. No. 738,084, and Ser. No. 738,085, both June 19, 1968. This application May 15, 1969, Ser. No. 825,028

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 13 Claims

7-aminocephalosporanic acid (7-ACA) of high purity is obtained by treating cephalosporin C with a nitrosating agent such as nitrosyl chloride followed by treatment of the reaction mixture with a lower alkylene oxide.

3,594,372

PYRIMIDO[4,5-e][1,4]OXAZEPIN-5-ONES AND DERIVATIVES THEREOF

Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Aug. 13, 1968, Ser. No. 752,164

Int. Cl. C07d *99/04*

U.S. Cl. 260—247.2B 21 Claims

Pyrimido[4,5-e][1,4]oxazepin-5-ones are prepared by the reaction of a 5-carbethoxy-4-chloropyrimidine with an aminoethanol. Compounds resulting from the reaction are pharmacodynamically active, particularly as central nervous system depressant agents.

3,594,373

BASES OF 2-ANILINOBENZOXAZOLES AND PROCESS FOR MAKING THEM

Francis Frederick Stephens and Christopher James Sharpe, London, England, assignors to Twyford Laboratories Limited

No Drawing. Filed Mar. 11, 1968, Ser. No. 711,866

Claims priority, application Great Britain, Mar. 20, 1967, 12,843/67

Int. Cl. C07d *89/32, 29/18, 99/00*

U.S. Cl. 260—247.5 15 Claims

Nitrogen bases of alkoxy-substituted anilinobenzoxazoles and the salts of these bases with physiologically acceptable acids, having utility as anti-depressive agents, are disclosed. These bases may be prepared by condensing a 2-halogeno- or 2-mercaptobenzoxazole with an aniline compound having an appropriately substituted alkoxy group in the para-position. The nitrogen base group may be present as the substituent on the alkoxy group before the condensation reaction or may be added as a separate step.

3,594,374

NOVEL N,N-BIS-(BIS-AMINO-S-TRIAZINYL)-ALKYLAMINES

Denis Varsanyi, Arlesheim, Basel-Land, and Willy Roth, Strengelbach, Aargau, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 560,855, June 27, 1966. This application Oct. 4, 1967, Ser. No. 672,701

Claims priority, application Switzerland, June 30, 1965, 9,158/65

Int. Cl. C07d *55/22*

U.S. Cl. 260—249.6 2 Claims

New N,N-bis-(bis-amino-s-triazinyl)-alkylamines in which up to 3 of the amino groups may be heterocyclic rings are useful as surface treating agents. Compositions containing certain of these new bis-s-triazinyl alkylamines and certain tris-amino-s-triazines and 1,4-bis-(bis-amino-s-triazinyl)-piperazines are also useful for surface treating, particularly as floor waxes and shoe polishes, and as textile softening components.

3,594,375

TRIAZINE COMPOUNDS

Max Schellenbaum, Muttenz, and Max Duennenberger, Frenkendorf, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,254

Claims priority, application Switzerland, Dec. 14, 1967, 17,546/67

Int. Cl. C07d *55/20*

U.S. Cl. 260—249.9 4 Claims

The present invention is concerned with new arylguanamines wherein one carbon atom of the triazine ring is linked directly to a benzene ring, the second carbon atom is linked by an —NH— group to a benzene ring and the third carbon atom is linked to an —HN— alkylene group, the latter being bound to the nitrogen atoms of a tertiary amino group. The new arylguanamines are useful for controlling harmful microorganisms.

3,594,376

PROCESS FOR PREPARING 4-PHENYL-QUINAZOLINE-2(1H)-ONES

Stanley C. Bell, Penn Valley, and Peter H. L. Wei, Springfield, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Application Feb. 23, 1968, Ser. No. 729,838, which is a division of application Ser. No. 447,545, Apr. 12, 1965. Divided and this application Sept. 5, 1969, Ser. No. 855,733

Int. Cl. C07d *51/48*

U.S. Cl. 260—251 1 Claim

The preparation of 4-phenylquinazoline-2(1H)-ones by reacting a 2-amino-diphenylmethyleneiminoacetic acid N-oxide with a phenyl haloformate. The products are known compounds having pharmaceutical and other utilities.

3,594,377

CONDENSATION PRODUCTS OF N-(3-THIAZOLIDINYLMETHYL)-NITROGEN BASE COMPOUNDS

Douglas I. Relyea, Pompton Plains, N.J., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Nov. 7, 1967, Ser. No. 681,115

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 8 Claims

The invention relates to reaction products of beta-mercaptoethylamine with an amide, imide, hydrazide or amine compound and formaldehyde to form an N-(3-thiazolidinylmethyl) nitrogen base compound.

3,594,378

THIAZOLOPYRIMIDINE DERIVATIVES AND PREPARATION THEREOF

Real Laliberte, St. Laval, Quebec, Canada, assignor to Ayerst, McKenna and Harrison Limited, St. Laurent, Quebec, Canada

No Drawing. Filed Oct. 24, 1969, Ser. No. 869,322

Int. Cl. C07d 51/46

U.S. Cl. 260—251 13 Claims

Disclosed herein are

2,3,5a,6,7,8,9,9a-octahydro-9a-hydroxycyclopenta [4,5]pyrimidino[2,1-b]benzothiazol-11(1H)-one,
2,3,7,8-tetrahydro-3-hydroxy-2-methylcyclopenta[d] thiazolo[3,2-a]pyrimidin-5(6H)-one,
2,3,7,8-tetrahydro-3-hydroxy-3-ethylcyclopenta[d] thiazolo[3,2-a]pyrimidin-5(6H)-one,
2,3,6,7,8,8a-hexahydro-8a-hydroxy-5aH-cyclopenta[d] cyclopenta[4,5]thiazolo[3,2-a]pyrimidin-10(1H)-one,
5a,6,7,8,9,9a-hexahydro-9a-hydroxy-3-methyl-1H-pyrimido[2,1-b]benzothiazol-1-one,
2,3-dihydro-3-hydroxy-3,7-dimethyl-5H-thiazolo[3,2-a] pyrimidin-5-one,
3-ethyl-2,3-dihydro-3-hydroxy-7-methyl-5H-thiazolo-[3,2-a]pyrimidin-5-one,
2,3,3a,9a-tetrahydro-9a-hydroxy-6-methyl-1H,8H-cyclopenta[4,5]thiazolo[3,2-a]pyrimidin-8-one,
5a,6,7,8,9,9a-hexahydro-9a-hydroxy-1H-pyrimido[2,1-b] benzothiazol-1-one,
2,3-dihydro-3-hydroxy-3-methyl-5H-thiazolo[3,2-a] pyrimidin-5-one,
3-ethyl-2,3-dihydro-3-hydroxy-5H-thiazolo[3,2-a] pyrimidin-5-one, and
2,3,3a,9a-tetrahydro-9a-hydroxy-1H,8H-cyclopenta[4,5] thiazolo-[3,2-a]pyrimidin-8-one.

The compounds have anti-inflammatory activity. The methods for their preparation and use are also disclosed.

3,594,379

2,3-DIHYDROIMIDAZO[1,2-c]QUINAZOLINES

Goetz E. Hardtmann, Florham Park, and Hans Ott, Convent Station, N.J., assignors to Sandoz-Warner, Inc., Hanover, N.J.

No Drawing. Filed Sept. 16, 1968, Ser. No. 760,076

Int. Cl. C07d 57/12

U.S. Cl. 260—256.4 16 Claims

The invention discloses 5-oxy-substituted-2,3-dihydroimidazo[1,2-c]quinazolines which are pharcameutically active and useful as hypotensive agents and as coronary dilators. Also disclosed are processes involved in preparation of said 2,3-dihydroimidazo[1,2-c]quinazolines employing intermediates which are 5-chloro-2,3-dihydroimidazo[1,2-c]quinazolines and 2-chloro-4-ethyleniminoquinazolines.

3,594,380

ISOQUINOLIN-1(2H)-ONES

Theodore S. Sulkowski, Narberth, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 627,284, Mar. 31, 1967. This application Feb. 18, 1969, Ser. No. 800,275

Int. Cl. C07d 35/14

U.S. Cl. 260—256.4 10 Claims

This invention is concerned with imidazolinylisoquinolinones and pyrimidinylisoquinolinones which are pharmacologically active as central nervous system depressants.

3,594,381

PROCESS FOR THE PREPARATION OF BENZO-PHENAZINE-DI-N-OXIDES

Florin Seng, Cologne-Buchheim, and Kurt Ley, Odenthal-Globusch, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,346

Claims priority, application Germany, Feb. 28, 1968, P 16 70 991.4

Int. Cl. C07d 51/80

U.S. Cl. 260—266 17 Claims

Reacting [optionally 4- and/or 5-(halo, alkyl, alkoxy, aminocarbonyl and/or aminosulfonyl)-substituted]-benzofuroxazan with [optionally 3-, 4-, 5-, 6-, 7- and/or 8-, especially mono or di (nitro, halo, sulfonic acid, sulfonic acid alkali metal salt, carboxy, amino, alkyl-sulfonylamino, alkyl-carbonylamino and/or chloro-substituted phenyl-carbonylamino)-substituted]- naphth- 1 or 2-ols, for example at temperatures of about 0–100° C., in the presence of a base or basic-reacting salt such as alkali metal -alcoholates, -hydroxides, -cyanides, -carbonates, alkaline earth metal hydroxides, and/or organic amines including ammonia, and also in the presence of a diluent such as water and/or organic liquids, to form the corresponding [optionally 2- and/or 3-(halo, alkyl, alkoxy, aminocarbonyl and/or aminosulfonyl)-substituted]-[optionally 5-, 6-, 7-, 8-, 9- and/or 10-, especially mono or di, (nitro, halo, sulfonic acid, sulfonic acid alkali metal salt, carboxy, amino, alkyl-sulfonylamino, alkyl-carbonylamino, and/or chloro-substituted phenyl-carbonylamino)-substituted]-ortho-benzo-phenazine-di-N-oxides, all but the corresponding unsubstituted compound of which are new and all of which possess fungicidal properties.

3,594,382

PROCESS FOR THE PREPARATION OF HYDROXY-PHENAZINE-DI-N-OXIDES

Florin Seng, Cologne-Buchheim, and Kurt Ley, Odenthal-Globusch, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,345

Claims priority, application Germany, Jan. 31, 1968, P 16 70 981.2

Int. Cl. C07d 51/80

U.S. Cl. 260—267 16 Claims

Reacting [optionally 4- and/or 5-(chloro, alkyl, alkoxy, aminocarbonyl and/or carboalkoxy)-substituted]-benzofurazan-N-oxide with at least the equimolar quantity of an aromatic hydroxy compound, e.g. [optionally 2-, 3- and/or 6-(chloro, hydroxy, alkyl, nitro, alkanoyl, aminocarbonyl-alkyl, phenyl, chlorophenyl, phenyl sulfonyl and/or pyrrodiazoly l -alkylaminocarbonyl-alkyl)-substituted]-1,4-di- and -1,3,5-tri-hydroxy-benzenes and [optionally 2-(chloro, hydroxy, alkyl, nitro, alkanoyl, aminocarbonyl-alkyl, phenyl, chlorophenyl, phenyl sulfonyl and/or pyrrodiazolyl-alkyl-aminocarbonyl - alkyl)-substituted]-1,4-hydroxy naphthalenes; optionally in the presence of a diluent, at temperatures of about 0–50° C., and in the presence of a base or basic-reacting salt, to form the corresponding [optionally 1-,3- and/or 4- (chloro, hydroxy, alkyl, nitro, alkanoyl, aminocarbonyl-alkyl, phenyl, chlorophenyl, phenyl sulfonyl and/or pyrrodiazolyl-alkyl aminocarbonyl-alkyl)-substituted]-[optionally 6- and/or 7- (chloro, alkyl, alkoxy, aminocarbonyl and/or carboalkoxy)-substituted] - 2 - hydroxy-phenazine-di-N-oxides, all the corresponding said substituted compounds of which are new, and all of which possess fungicidal properties.

3,594,383

PROCESS FOR THE PREPARATION OF HYDROXY-PHENAZINE-DI-N-OXIDES

Florin Seng, Cologne-Buchheim, and Kurt Ley, Odenthal-Globusch, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,347
Claims priority, application Germany, Mar. 5, 1968, P 16 70 994.7
Int. Cl. C07d 51/80
U.S. Cl. 260—267 13 Claims

Reacting [optionally 4- and/or 5- (chloro, alkyl and/or alkoxy)-substituted]-benzofurazan-N-oxide with (optionally 2-, 3- and/or 6-(mono or di -chloro, -phenyl and/or -chlorophenyl)-substituted]-benzoquinone or corresponding [optionally 2-(chloro, phenyl or chlorophenyl)-substituted]-naphthoquinone, in the presence of a diluent and at least an equimolar amount of an oxidizable basic agent at a temperature of about 0–100° C. to form the corresponding [optionally 1-, 3- and/or 4-(mono or di -chloro, -phenyl and/or -chlorophenyl)-substituted]-[optionally 6- and/or 7-(chloro, alkyl and/or alkoxy)-substituted]-2-hydroxy-phenazine-di-N-oxides and the corresponding orthobenzo-hydroxy-phenazine-di-N-oxides, all but the corresponding unsubstituted compound of which are new and all of which possess fungicidal properties.

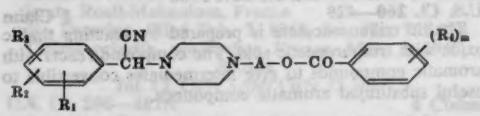
3,594,384

PHARMACOLOGICALLY-ACTIVE TRIMETHOXY-BENZOXYALKYL-PIPERAZINO [1'] COMPOUNDS

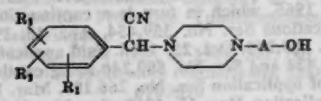
Adolf Stachel, Frankfurt am Main, Fechenheim, Rudi Beyerle, Bruchkobel, and Rolf-Eberhard Nitz and Klaus Resag, Frankfurt am Main, Fechenheim, Germany, assignors to Cassela Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,692
Claims priority, application Germany, Oct. 12, 1967, P 16 70 478.2
Int. Cl. C07d 51/70
U.S. Cl. 260—268CN 6 Claims

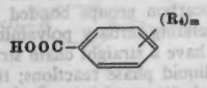
The present invention relates to pharmacologically-active α-piperazinophenylacetonitrile derivatives having the structural formula



wherein R_1, R_2 and R_3 may be hydrogen, halogen or alkoxy groups, where R_4 is an alkoxy group, where *m* may be either 1, 2 or 3, and where A is a straight or branched chain alkylene radical containing 2–4 carbon atoms, by reacting in a conventional manner an α-piperazinophenylacetonitrile having the structural formula



with an acid halide of an alkoxybenzoic acid having the structural formula



an acid-binding agent being used, if desired.

3,594,385

SYNTHESIS OF NEW NF COMPOUNDS

Thomas Harland Brownlee, Westport, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 578,420, Sept. 2, 1966. This application Aug. 2, 1967, Ser. No. 660,870
Int. Cl. C07d 29/26, 31/42, 27/00
U.S. Cl. 260—290 2 Claims

A novel process for the production of NF compounds which comprises reacting a conjugated diene with a compound having the formula

(I) $F_2N—R^6$

wherein R^6 is

(1) a $C\equiv N$, (2) a $\begin{matrix}C=NF\\ |\\ NF_2\end{matrix}$ or (3) a $\begin{matrix}C=NF\\ |\\ F\end{matrix}$

radical is disclosed as are the novel compounds produced thereby.

3,594,386

8-SUBSTITUTED-1-OXA-3,8-DIAZASPIRO[4,5] DECAN-2-ONES

Gilbert Regnier, Sceaux, Roger Canevari, L'Hay-les-Roses, and Jean-Claude Le Douarec, Suresnes, France, assignors to Science Union et Cie, Société Francaise de Recherche Medicale, Suresnes, France

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,871
Claims priority, application Great Britain, Dec. 29, 1967, 58,994/67
Int. Cl. C07d 29/30
U.S. Cl. 260—293.4 12 Claims

1-oxa-2-oxo-3,8-diazo spiro (4,5) decanes substituted in 8-position by

(1) $Ar—X—(CH_2)_n$

wherein X is —CO—, —CHOH—, —CH(OCH$_3$)—,

n is 1, 2 or 3, and
Ar is phenyl or mono- or di-halo-phenyl, or

(2) $Ar—(CH_2)_2—$

wherein Ar is 2-pyridyl or 4-pyridyl or certain substituted phenyl.

These compounds possess analgesic, antiinflammatory, central nervous system depressant and bronchodilator properties.

3,594,387

METHOD OF PREPARING 2-IMINO-OXAZOLIDINES AND THE STABILIZATION OF POLYESTERS THEREWITH

Sidney H. Metzger, New Martinsville, W. Va., assignor to Mobay Chemical Company, Pittsburgh, Pa.

No Drawing. Filed Oct. 9, 1964, Ser. No. 402,951
Int. Cl. C07d 85/26, 95/00
U.S. Cl. 260—307 8 Claims

This invention relates to 2-imino-oxazolidines, methods of preparation and to the stabilization of ester-containing compositions against hydrolysis.

3,594,388

4-AMINO-5-(SUBSTITUTED PHENYL) FURAZAN

Claude Lehmann, Ernst Renk, and André Gagneux, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Feb. 2, 1968, Ser. No. 702,551
Claims priority, application Switzerland, Feb. 7, 1967, 1,894/67
Int. Cl. C07d 85/56
U.S. Cl. 260—307 9 Claims

The compounds are of the class of furazan derivatives, more particularly 4-amino-5-phenyl furazan derivatives

wherein the phenyl ring is further substituted. The compounds are useful as anticonvulsive, muscle-relaxing agents and agents depressing the central nervous system (CNS). An illustrative embodiment is 3-amino-4-(α,α,α-trifluoro-o-tolyl) furazan.

3,594,389

CERTAIN 4-(N-ALKENYLCARBAMYL) THIAZOLES

Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed June 12, 1969, Ser. No. 832,853
Int. Cl. C07d 91/30
U.S. Cl. 260—302R 4 Claims

Substituted thiazoles useful as antibiotics and antifungal agents or as anti-radiation chemicals, are obtained by treatment of a thiazoline azetidinone with an acid or a base to open the β-lactam ring. The thiazoline azetidinone is obtained by treatment of a penicillin sulfoxide with triphenyl phosphine or a trialkyl phosphite.

3,594,390

ISOTHIURONIUM SALTS

Helmut Timmler, Wuppertal-Vohwinkel, Ingeborg Hammann, Cologne, and Richard Wegler, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 7, 1967, Ser. No. 658,631
Claims priority, application Germany, Aug. 30, 1966, F 50,078
Int. Cl. C07f 9/16, 9/40
U.S. Cl. 260—308 9 Claims

(Alkyl, phenyl or O-alkyl)-(O-alkyl)-(O- or S-[4-unsubstituted or (amino, alkyl, phenyl or [halo, nitro, alkyl, alkoxy and/or alkylmercapto] substituted phenyl) substituted-5-unsubstituted or alkyl or phenyl substituted-1,2,4-triazoline-3- thione-2-yl-methyl]- -phosphoric, phosphonic, thiolphosphoric, thiolphosphonic, thionothiolphosphoric and thionothiolphosphonic acid esters which possess pesticidal, especially acaricidal and insecticidal, properties and which may be produced by reacting the corresponding phosphoric, phosphonic, thio or dithio -phosphoric or -phosphonic acid ester with the corresponding 2-(N-halomethyl)-1,2,4-triazoline-3-thione.

3,594,391

2-HALO-3-SUBSTITUTED INDOLES

Milton Wolf, West Chester, John H. Sellstedt, St. Davids, and Harry Rosen, Drexel Hill, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 9, 1969, Ser. No. 831,702
Int. Cl. C07d 27/56
U.S. Cl. 260—326.15 8 Claims

This invention concerns 2-halo-3-substituted indoles which are useful as bronchodilators. Further, it relates to the process of preparing some of these compounds by the halogenation of appropriate 3-substituted indoles.

3,594,392

DIBENZO[b,e]THIEPINE-1,1-DIOXIDES

Stanley O. Winthrop and Martin A. Davis, Montreal, Quebec, Canada, assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Dec. 4, 1961, Ser. No. 158,636
Int. Cl. C07d 67/00
U.S. Cl. 260—327 4 Claims

Dibenzo [b,e]thiepine - 1,1 - dioxides, having antihistaminic and anticholinergic properties, and intermediates therefor are disclosed.

3,594,393

USE OF POLYURETHANES AS DEMULSIFIERS

Rudolf S. Buriks, Franklin E. Mange, and Patrick M. Quinlan, St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,928
Int. Cl. B01d 17/00
U.S. Cl. 252—327 9 Claims

A process of employing polyurethanes as demulsifiers in preventing, breaking and/or resolving emulsions of the water-in-oil type, and more particularly petroleum emulsions.

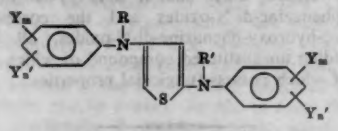
3,594,394

THIOPHENE DIAMINE DERIVATIVES

John Paul Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed July 16, 1969, Ser. No. 842,372
Int. Cl. A01n 9/12; C07d 63/12
U.S. Cl. 260—329AM 8 Claims

Novel thiophene diamine derivatives of the formula:



wherein R and R′ are independently primary or secondary alkyl having not more than 4 carbon atoms, Y and Y′ are independently selected from the group consisting of alkyl having a maximum of four carbon atoms, halogen, and nitro, and *m* and *n* are each integers from 0 to 2; and methods for making these compounds. These compounds have utility as herbicides, anthelmintics, and as intermediates for making insecticides.

3,594,395

THALLIC TRIFLUOROACETATE AND PROCESS

Edward C. Taylor, Princeton, N.J., and Alexander McKillop, Norwich, England, assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,765
Int. Cl. C07f 5/00
U.S. Cl. 260—429 1 Claim

Thallic trifluoroacetate is prepared by reacting thallic oxide with trifluoroacetic acid. The compound reacts with aromatic compounds to give intermediates convertible to useful substituted aromatic compounds.

3,594,396

CRYSTALLINE ORGANOLITHIUM COMPLEXES CONTAINING SILICON

Arthur W. Langer, Jr., 175 Oakwood Road, Watchung, N.J. 07060

No Drawing. Division of application Ser. No. 690,054, Dec. 13, 1967, which is a continuation-in-part of application Ser. No. 560,110, June 24, 1966, which is a continuation-in-part of application Ser. No. 505,976, Nov. 1, 1965, which in turn is a continuation-in-part of applications Ser. No. 359,434, Apr. 13, 1964, and Ser. No. 589,240, Oct. 25, 1966. Said applications Ser. No. 359,434 and Ser. No. 589,240 being continuations-in-part of application Ser. No. 266.188, Mar. 19. 1963. This application Dec. 17, 1969, Ser. No. 886,009
Int. Cl. C07f 7/10; B01j 11/06
U.S. Cl. 260—448.2N 5 Claims

New crystalline organolithium compounds which consist of an organolithium in which the organic radical consists of hydrocarbon groups bonded to silicon complexed with a chelating tertiary polyamine in which the monomeric units have a straight chain structural formula are prepared in liquid phase reactions; the products are useful as polymerization and isomerization catalysts and as reagents in organometallic synthesis.

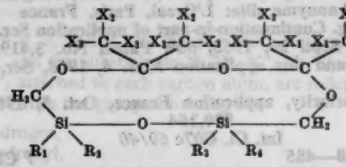
3,594,397

HALOGENATED SILICON-CONTAINING CYCLIC ACETALS

François Meiller, Palaiseau, France, assignor to Société Industrielle des Silicones, Paris, France

No Drawing. Filed Oct. 16, 1969, Ser. No. 867,067
Claims priority, application France, Oct. 18, 1968, 170,480
Int. Cl. C07d *103/02*
U.S. Cl. 260—448.2B 23 Claims

Halogenated silicon-containing cyclic acetals having the formula:



wherein X_1, X_2 and X_3 are bromine, chlorine or fluorine and R_1, R_2, R_3 and R_4 are the same or different groups, such as alkyl, aryl and substituted aryl, prepared by the reaction of a hexahaloacetone with a siloxanediol. The compounds are useful as anti-foaming agents, extraction solvents, and wetting agents.

3,594,398

METHOD FOR PRODUCING N-FORMIMIDATE

Takeo Saegusa and Yoshihiko Ito, Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Jan. 25, 1968, Ser. No. 700,390
Claims priority, application Japan, Apr. 5, 1967, 42/21,756
Int. Cl. C07c *119/00*
U.S. Cl. 260—453 4 Claims

N-substituted formimidate is prepared in high yield by reacting alcohol with isonitrile with the aid of copper, silver or mercury or oxide of these metals. The thus-obtainable formimidates are useful as agricultural chemicals.

3,594,399

MANUFACTURE OF ALCOHOLS BY OXIDATION OF SATURATED HYDROCARBONS

Jacob Alagy, La Celle-Saint-Cloud, France, assignor to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed Feb. 7, 1968, Ser. No. 703,529
Claims priority, application France, Mar. 1, 1967, 97,048
Int. Cl. C07f *5/04*; C07c *35/08*
U.S. Cl. 260—462A 4 Claims

A process for converting cyclohexane to cyclohexanol by contacting the cyclohexane in the liquid phase with gas containing molecular oxygen wherein the oxidation step is conducted in the presence of sulfate of the alkali and alkaline earth metals.

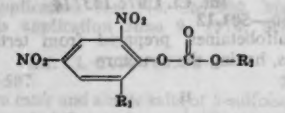
3,594,400

CYANOALKYL-NITROPHENYL CARBONATES

Krijn van den Boogaart and Meelis Nicolaus Louis, Vlaardingen, Netherlands, assignors to N.V. Fabriek Van Chemische Producten Vondelingenplaat, Rotterdam, Netherlands

No Drawing. Filed Mar. 5, 1968, Ser. No. 710,630
Claims priority, application Netherlands, Mar. 7, 1967, 6703598
Int. Cl. C07c *79/28*; A01n *9/20*
U.S. Cl. 260—463 7 Claims

Compounds of structure



where R_1 is alkyl of one to ten carbon atoms, and R_2 is cyanoalkyl containing from one to four carbon atoms in the alkyl group. These compounds are extremely effective as acaricides and also have fungicidal and herbicidal activity.

3,594,401

ACETYLENICALLY UNSATURATED DIARYL NITRILES AND DERIVATIVES THEREOF

John F. Cavalla, Isleworth, Gillian M. Sandison, Datchet, and Alan C. White, Windsor, England, assignors to John Wyeth & Brother Limited, Taplow, Maidenhead, England

No Drawing. Continuation-in-part of application Ser. No. 619,207, Feb. 28, 1967. This application Nov. 18, 1969, Ser. No. 877,840
Claims priority, application Great Britain, Mar. 3, 1966, 9,319/66
Int. Cl. C07c *121/70*
U.S. Cl. 260—465E 4 Claims

Certain diaryl-substituted acetylenically unsaturated compounds bearing a cyano, carboxylic acid, ester, or amide substituent or hydroxymethyl or aminomethyl, and optionally an amino substituent, exhibit useful CNS activity as anticonvulsants and are also useful as anti-inflammatory agents and tranquilizers, etc.

3,594,402

TETRAACETONITRILOLITHIUMHEXAFLUOROPHOSPHATE AND METHOD FOR THE PREPARATION THEREOF

Robert A. Wiesboeck, Atlanta, Ga., assignor to United States Steel Corporation

No Drawing. Filed May 29, 1969, Ser. No. 829,111
Int. Cl. C07c *12/28*
U.S. Cl. 260—465.8 4 Claims

Tetraacetonitrilolithiumhexafluorophosphate, a new compound prepared by reacting lithium fluoride and PF_5 or previously prepared $LiPF_6$ with excess CH_3CN, is disclosed. Tetraacetonitrilolithiumhexafluorophosphate is useful for the production of high purity exceptionally active $LiPF_6$ which is also a new composition of matter. The preparations of these new compositions are also disclosed.

3,594,403

9,15-DIOXOPROSTA-8(12),13-DIENOIC ACID AND METHYL ESTER

Masateru Miyano, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 688,981, Dec. 8, 1967. This application Jan. 8, 1968, Ser. No. 696,101
Int. Cl. C07c *61/36, 67/74*
U.S. Cl. 260—468 3 Claims

9,15-dioxoprosta-8(12),13-dienoic acid derivatives useful as hypocholesterolemic, anti-ulcerogenic and anti-protozoal agents and preparable by the condensation of 6-hexanoylbicyclo[2.2.1]hept-2-en-5-yl chloromethyl ketone with dimethyl 3-oxoundecane-1,11-dioate followed by hydrolysis, decarboxylation, esterification and pyrolysis of the resulting adduct to afford methyl 9,15-dioxoprosta-8(12),13-dienoate, which is reduced and/or saponified to afford the related derivatives.

3,594,404

RACEMIC AND OPTICALLY ACTIVE p-PHENYLHYDRATROPIC ACID, 2,3-DIHYDROXYPROPYL ESTERS

James R. Fisher, Royal Oak, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed July 1, 1968, Ser. No. 741,276
Int. Cl. C07c *69/76*; A61k *27/00*
U.S. Cl. 260—469 4 Claims

2,3-dihydroxypropyl esters of d-, l-, and dl-p-phenylhydratropic acids, useful as pharmacological agents having anti-inflammatory activity, and their production by (a) reacting p-phenylhydratropic acid, in racemic or in optically active form, or a carboxylate salt thereof, with a 3-halo-1,2-propanediol, and (b) reacting a (1,3-di-

oxolan-4-yl)methyl ester of d-, l-, or dl-p-phenylhydratropic acid with a strong acid, whereby the dioxolane ring is cleaved.

3,594,405

SUBSTITUTED PYRANYL ANILINES AS PLANT GROWTH MODIFIERS

Harvey M. Loux, Valley View, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 17, 1968, Ser. No. 729,900

Int. Cl. C07d *7/04*

U.S. Cl. 260—345.1 **3 Claims**

This disclosure teaches that novel 2-tetrahydropyranylanilines such as 3,4-dichloro-N-(tetrahydro-2-pyranyl)-aniline when applied to plants effect a modification of the growth pattern of said plant.

3,594,406

SUBSTITUTED-DES-A-ANDROSTAN-5-ONES

Milan Radoje Uskokovic, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application Oct. 20, 1965, Ser. No. 499,094, which is a continuation-in-part of application Ser. No. 400,206, Sept. 29, 1964, now Patent No. 3,412,107, dated Nov. 19, 1968. Divided and this application June 13, 1968, Ser. No. 736,585

Int. Cl. C07c *49/30*; C07d *7/04*

U.S. Cl. 260—345.9 **9 Claims**

This invention is directed to substituted-des-A-androstan-5-ones and derivatives thereof which are useful as intermediates in the production of known steroids of the androstane series. These latter compounds can be utilized as anabolic and antiandrogenic agents.

3,594,407

13,17-DIALKYL-19-NORPREGN-4-ENE, 3,20-DIONES

Daniel M. Teller, King of Prussia, George H. Douglas, Chester, and Herchel Smith, Delaware, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 614,410, Feb. 7, 1967. This application Apr. 3, 1969, Ser. No. 813,284

Int. Cl. C07c *169/08*

U.S. Cl. 260—397.3 **8 Claims**

The compounds of the class of 13,17-dialkyl-18,19-dinorpregn-4-en-3,20-diones and 13,17,21,21,21-pentaalkyl-18,19-di-norpregn-4-en-3,20-diones are prepared and found to be hormonally useful.

3,594,408

RESORCINOL DIALKYL BENZOATES

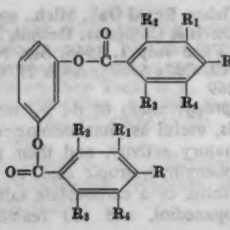
John Frederick Hosler, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Apr. 28, 1966, Ser. No. 545,851, now Patent No. 3,391,108, dated July 2, 1968. Divided and this application Feb. 1, 1968, Ser. No. 702,200

Int. Cl. C07c *69/78*; C08b *45/58*

U.S. Cl. 260—476R **4 Claims**

As new chemical compounds, resorcinol di(alkylbenzoates) of the formula:



wherein each R is an alkyl radical of from four to twelve carbon atoms and each R_1, R_2, R_3 and R_4 is individually either hydrogen or alkyl of 1–4 carbon atoms. These compounds are useful as light stabilizers for polymers prepared from mono-olefins having from 2 to 4 carbon atoms.

3,594,409

MAGNESIUM SALTS OF SUCCINIC ACID ESTERS

Felix Lachampt, Franconville, Andre Viout, Paris, and Guy Vanlerberghe, Mitry-Mory, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

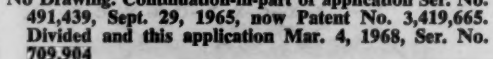
No Drawing. Continuation-in-part of application Ser. No. 491,439, Sept. 29, 1965, now Patent No. 3,419,665. Divided and this application Mar. 4, 1968, Ser. No. 709,904

Claims priority, application France, Oct. 5, 1964, 990,354

Int. Cl. C07c *69/40*

U.S. Cl. 260—485 **7 Claims**

Emulsifier compounds which are magnesium salts of a succinic ester of a polyoxyalkylene fatty alcohol having the formula:



(I)

in which:

m is an integer between 12 and 28 inclusive,

n and *p* are numbers lying between 0 and 12 inclusive, while the sum of *n* and *p* falls between 2 and 12 inclusive, which produce unusually stable water in oil emulsions.

3,594,410

ADDITION POLYMERIZABLE BRANCHED CHAIN POLYOL POLYESTERS OF ALPHA-METHYLENE CARBOXYLIC ACIDS

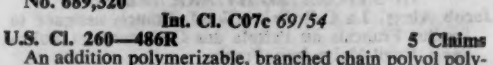
Abraham Bernard Cohen, Springfield, and Arnold Charles Schoenthaler, East Brunswick, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application May 26, 1964, Ser. No. 370,338, now Patent No. 3,380,831, dated Apr. 30, 1968. Divided and this application Dec. 11, 1967, Ser. No. 689,320

Int. Cl. C07c *69/54*

U.S. Cl. 260—486R **5 Claims**

An addition polymerizable, branched chain polyol polyester of an alpha-methylene carboxylic acid of 3–4 carbon atoms represented by the formula:



where Q is H, CH_3 or C_2H_5, R is H or CH_3, *x* is 3 to 6 and equal or greater than *y*+*z*, *y* is 2–6, *z* is 0 or 1–4, and *y*+*z* is more than 2, *m* is 0, 1 or more, *n* is 1 or more, and *ny*+*mz* is more than 6 but less than 500. The polyesters are useful in photopolymerizable compositions, have water-miscible characteristics, are less toxic, and more efficient than other polyesters.

3,594,411

SULFOBETAINE DETERGENTS, AND LUBRICANTS AND COSMETICS CONTAINING SAME

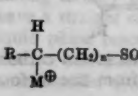
George F. Kite, Springdale, and Arthur C. Whitaker, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Apr. 25, 1968, Ser. No. 724,290

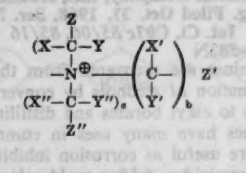
Int. Cl. C07c *143/14*

U.S. Cl. 260—501.12 **4 Claims**

Novel sulfobetaines, prepared from tertiary amines and sultones, having the structure

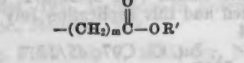


in which R is an alkyl group having from 6 to 23 carbon atoms, *n* is the integer 2 or 3, and M⊕ is a radical having the structure



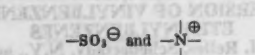
wherein *a*, *b*, and *c* are, independently, integers of from 1 to 6, and the substituents X, X', X'', Y, Y', Y'', Z, Z', and Z'', attached to each carbon atom, are independently, selected from the group consisting of:

(i) hydrogen,
(ii) hydroxyl,
(iii) halogen,
(iv)

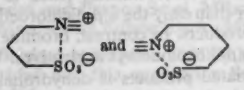


in which *m* is 0 or an integer of from 1 to 5 and R' is H— or an alkyl group having from 1 to 3 carbon atoms,
(v) —NR_2'' in which each R'' is, independently, H— or an alkyl group having from 1 to 4 carbon atoms, and
(vi) —OR''', in which R''' is an alkyl group having from 1 to 4 carbon atoms, at least one of said substituents being other than hydrogen are provided.

The five or six membered chain including the



groups provides for ready inner salt or ring formation, giving resistance to degradation, such as



not readily obtained with similar chains containing other numbers of atoms such as ≡N⊕—CH_2—CH_2—SO_3⊖, which would require a highly strained four-membered ring. A more effective detergent is provided than in compounds having the nitrogen atom in the longest chain of the molecule. The detergent compounds are useful, for example, in lubricants and cosmetics, all as is more particularly described in the specification which follows.

3,594,412

PROCESS FOR THE PREPARATION OF SURFACE-ACTIVE DERIVATIVES OF 5 - SULFOISOPHTHALIC ACID

Rudolf Burkhardt, Witten (Ruhr), Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf (Berizt Cologne), Germany

No Drawing. Continuation of application Ser. No. 704,990, Feb. 13, 1968, which is a continuation-in-part of application Ser. No. 367,200, May 13, 1964. This application June 9, 1970, Ser. No. 44,861

Int. Cl. C07c *143/52*

U.S. Cl. 200—507 **2 Claims**

Surface-active ester and amide salts of 5-sulfoisophthalic acid are prepared by reacting an alkali or alkaline earth metal salt of 5-sulfoisophthalic acid dimethyl ester with an alcohol or an amine having 4 to 12 carbon atoms in the alkyl group to produce the desired dialkyl ester and dialkyl amide salts, respectively, of 5-sulfoisophthalic acid.

3,594,413

CYCLOPENTENE DERIVATIVES

Harvey E. Alburn, West Chester, and Horace Fletcher III, Pottstown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 20, 1968, Ser. No. 777,506

Int. Cl. C07c *101/14*

U.S. Cl. 260—514 **2 Claims**

This invention is concerned with the preparation of cyclopentene - 1,1 - dicarboxamides; 1,3-diazaspiro[4,4] nonene-2,4 - diones; 1 - aminocyclopentene-1-carboxylic acids; 1-(N - alkylamino)cyclopentene - 1 - carboxylic acids; and 3-oxa-1-azaspiro[4,4] nonene-2,4-diones which are intermediates in the preparation of 6-(1-aminocyclopentene-1-carboxamido)penicillanic acids which are useful antibacterial agents.

3,594,414

PROCESS FOR THE PREPARATION OF FIBER-GRADE TEREPHTHALIC ACID

Ewald Katzschmann, Witten-Bommern, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

No Drawing. Filed Sept. 1, 1967, Ser. No. 664,948

Claims priority, application Germany, Sept. 3, 1966, D 51,020

Int. Cl. C07c *63/26*

U.S. Cl. 260—515R **15 Claims**

A process for the preparation of fiber-pure terephthalic acid which comprises hydrolyzing dimethyl terephthalate at a temperature of from about 180° to 280° C., preferably 200°–250° C. The process is advantageously carried out under pressure in a corrosion-proof vessel with an aqueous solution of a neutral water-soluble inorganic salt, said salt being used in concentrations of about 5 to 50% by weight. The preferred salts employed are sodium chloride, potassium chloride and calcium chloride. The process may be carried out as a continuous process with the obtained terephthalic acid being further purified by subsequent washings or by steam distillation. Left-over filtrates and washings are recycled to the reaction solution for a more efficient operation.

3,594,415

TRICARBALLYLIC ACIDS

William A. Zisman, Silver Spring, and Jacques G. O'Rear, Camp Springs, Md., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Aug. 30, 1968, Ser. No. 756,426

Int. Cl. C07c *63/56*

U.S. Cl. 260—515 **3 Claims**

New triacids which are ω-(p-chlorophenyl)- and ω-(3,4,5-trichlorophenyl) n-alkyltricarballylic acids in which the alkyl group has from 3 to 20 carbon atoms. The new triacids are used to prime hard inorganic solids with a film which, essentially, is an adsorbed monolayer of the triacid. The film is a coupling agent for promoting bonding of organic coatings to the solids.

3,594,416

MELTING OF UREA CRYSTALS

Robert N. Summerville, Cranford, and Arthur M. Bauer, Tenafly, N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Apr. 10, 1968, Ser. No. 720,156

Int. Cl. C07c *127/00*

U.S. Cl. 260—555 **5 Claims**

A process and apparatus for producing a urea melt wherein the urea is melted in a plurality of steam heated

vertical tubes, while being maintained in equilibrium with solid urea, to produce a urea melt essentially at or slightly above the melting point of urea, approximately 271° F. The total residence time for the melting is maintained at less than 7 minutes whereby increase in biuret content during melting is minimized.

3,594,417
SUBSTITUTED 2-ARYLALKYLOXY BENZAMIDES
Michel Leon Thominet, Paris, France, assignor to Société d'Etudes Scientifiques et Industrielles de L'Ile-de-France, Paris, France
No Drawing. Filed Mar. 21, 1968, Ser. No. 714,795
Claims priority, application France, Apr. 3, 1967, 101,328; June 23, 1967, 111,808
Int. Cl. C07c *103/26*
U.S. Cl. 260—559S 5 Claims

The 2-arylalkyloxy-benzamides of this invention are useful for the production of anesthesia, such as local anesthesia, in mammals. When administered intramuscularly, compounds of this invention show significant anesthesia when compared with xylocaine. Again, intradermic injections of 0.2 ml. of a solution of such a compound in concentrations varying from 0.1 to 1.25 mg./ml. effect suppression of platysma tremor produced by the prick of a pin in guinea pigs. The LD_{50} dosage of the compounds evaluated on mice and rats proved compatible in therapeutic use on mammals.

3,594,418
1-(2-HYDROXYHEXAFLUORO-2-PROPYL) 3,4-DIAMINO-BENZENE
Everett E. Gilbert, Morristown, N.J., assignor to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Jan. 17, 1969, Ser. No. 792,130
Int. Cl. C07c *91/42*
U.S. Cl. 260—575 1 Claim

New (2-hydroxyhexafluoro-2-propyl) benz-substituted benzoheterocyclic nitrogen compounds useful in the preparation of benzoheterocyclic nitrogen compound carboxylic acids and as hypotensive agents, and new (2-hydroxyhexafluoro-2-propyl)-3,4-diaminobenzene precursor for such compounds.

3,594,419
PROCESS FOR CONVERTING NITROPARAFFINS TO AMINES
Robert W. Rosenthal, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Apr. 15, 1968, Ser. No. 721,199
Int. Cl. C07c *88/10*
U.S. Cl. 260—583 3 Claims

A process which involves subjecting a nitroparaffin to reaction with hydrogen in the presence of ammonia and a hydrogenation catalyst to convert the nitroparaffin to the corresponding primary amine.

3,594,420
PROCESS FOR PRODUCING AMINES
Georges Gobron and Remy Proust, Melle, France, assignors to Melle-Bezons, Melle, Deux-Sevres, France
No Drawing. Filed Oct. 14, 1968, Ser. No. 767,466
Claims priority, application France, Oct. 25, 1967, 125,763
Int. Cl. C07c *85/00*
U.S. Cl. 260—583R 9 Claims

The preparation of monoethylamine, which may be accompanied by the formation of small amounts of diethylamine by hydrogenation of aldehyde ammonia in solution in monoethylamine, diethylamine or mixtures thereof.

3,594,421
RECOVERY OF PRIMARY AMINES
James Edward Kmiecik, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.
No Drawing. Filed Oct. 31, 1968, Ser. No. 772,371
Int. Cl. C07c *85/06, 85/16*
U.S. Cl. 260—583N 6 Claims

Primary amines are recovered from the products of reductive amination of alcohols by converting the unreacted alcohols to alkyl borates and distilling the amines. Primary amines have many uses in commerce, for example, they are useful as corrosion inhibitors, ore flotation agents, germicides, rubber mold release agents, pigment coating agents and chemical intermediates.

3,594,422
CHEMICAL PROCESS
Richard L. Golden, Oradell, N.J., and Gerald Mazzella, Brooklyn, N.Y., assignors to Halcon International, Inc.
No Drawing. Original application Jan. 29, 1965, Ser. No. 429,165, now Patent No. 3,423,471, dated Jan. 21, 1969. Divided and this application July 25, 1968, Ser. No. 747,434
Int. Cl. C07c *45/12*
U.S. Cl. 260—586B 4 Claims

This invention relates to an improved process for the recovery of boron compounds used to form borate esters in hydrocarbon oxidation processes, which comprises removing dissolved and entrained organic material from the aqueous phase of the hydrocarbon oxidation process by adsorption in a carbon bed.

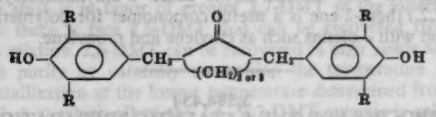
3,594,423
CONVERSION OF VINYLBENZENES TO ETHYNYLBENZENES
Howard M. Relles, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Filed Oct. 3, 1969, Ser. No. 863,720
Int. Cl. C07c *15/02*
U.S. Cl. 260—668 9 Claims

Chlorination of vinylbenzenes leads to a mixture of products rather than only the α,β-dichloroethyl derivatives, the expected products. In contrast, bromine produces only the expected α,β-dibromoethyl derivatives. When the mixture of chlorinated products is dehydrohalogenated with most of the dehydrohalogenating agents found useful for the dehydrobromination of the brominated products, a lower yield of the corresponding ethynyl compounds or only partially dehydrochlorinated products are obtained with considerable amounts of chlorinated products remaining unconverted because of their nonreactivity with the dehydrohalogenating agents. However, it has been found that alkali metal amides are capable of completely dehydrochlorinating the mixture of chlorinated products to the desired ethynyl compounds. This permits low cost chlorine to be substituted for the more expensive bromine and provides an economical process for converting vinylbenzenes to the corresponding ethynylbenzenes without the production of undesired by-products. The acetylene products are useful in making polyacetylenes.

3,594,424
2,6-BIS(3,5-DIALKYL-4-HYDROXYBENZYL) CYCLOALKANONES
Robert A. Krueger, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
No Drawing. Filed Nov. 1, 1967, Ser. No. 679,622
Int. Cl. C07c *49/82*
U.S. Cl. 260—590 3 Claims

Disclosed are novel 2,6-bis(3.5-dialkyl-4-hydroxybenzyl)cycloalkanones which are useful antioxidants for olefin

polymers. The particular 2,6-bis(3,5 - dialkyl-4-hydroxybenzyl)cycloalkanones of this invention have the formula



where R is a hydrocarbon radical and are useful as protective agents for poly(ethylene), poly(4-methylpentene-1), poly(propylene) and other olefin polymers.

3,594,425

HYDROFORMYLATION PROCESS

Walter H. Brader, Jr., Stanley B. Cavitt, and Robert M. Gipson, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed July 7, 1966, Ser. No. 563,374

Int. Cl. C07c 45/08

U.S. Cl. 260—604 10 Claims

Olefins are reacted with carbon monoxide and hydrogen to yield an aldehyde or alcohol having one more carbon atom than the olefin under hydroformylation reaction conditions in the presence of a complex catalyst comprising as essential ingredients a transition metal and a polyamine containing at least two amino-functional groups where the amino-functional groups are separated by one to four carbon atoms.

3,594,426

PROCESS FOR THE PREPARATION OF TRI-ORGANO-BORON COMPOUNDS

Antonio Salvemini and Franco Smai, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Original application Feb. 2, 1967, Ser. No. 613,416. Divided and this application Sept. 30, 1969, Ser. No. 862,464

Claims priority, application Italy, Feb. 3, 1966, 2,296/66

The portion of the term of the patent subsequent to Oct. 28, 1986, has been disclaimed

Int. Cl. C07f 5/02

U.S. Cl. 260—606.5B 6 Claims

Process for the preparation of organoboron compounds of the general formula BR_3, wherein R is an alkyl, aryl, cycloalkyl or aralkyl radical, for using in catalysts for the polymerization of vinyl compounds in organic synthesis, etc., by reacting the components of a Grignard reagent of the general formula $R \cdot Mg \cdot X$, where R is the aforementioned radical and X is a halogen from the group of chlorine, bromine and iodine, with a polyborate boron derivative of the general formula $(R'O)_3B \cdot nB_2O_3$ (where R' is an alkyl radical having a straight or branched chain containing from 2 to 6 carbon atoms, a phenyl, an alkyl substituted-phenyl or phenyl substituted alkyl, and *n* is a number equal to or upwards of 1, but preferably less than 2). This Grignard reagent is prepared from an RX type compound and a suspension of magnesium in an inert organic hydrocarbon solvent containing only catalytic quantities of an ether such that the molar ratio of ethers to the RX compound ranges substantially from 0.01 to 0.5. The magnesium may be activated with small quantities of ethyl iodide prior to its incorporation in the suspension.

3,594,427

ADAMANTANE BISPHENOLS

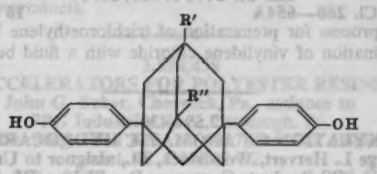
Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company

No Drawing. Filed Feb. 26, 1969, Ser. No. 802,661

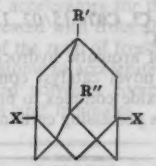
Int. Cl. C07c 39/12

U.S. Cl. 260—619B 3 Claims

Bisphenols of the structure



where R' and R'' are hydrogen or a hydrocarbon radical are prepared by reacting a compound of the structure



where X is bromo or chloro with phenol at reflux for several hours. The adamantane bisphenols are useful for preparing polyesters and polycarbonates as films or coating which have unusually high thermal stability.

3,594,428

PROCESS FOR PREPARING 1,1-DICHLOROETHYLENE, 1,2 - DICHLOROETHYLENE AND VINYL CHLORIDE

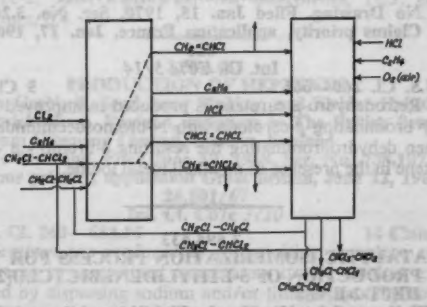
Albert Antonini, Paris, Gustave M. Stahl, Saint-Auban, and Claude Vrillon, Montmagny, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Paris, France

Filed May 20, 1968, Ser. No. 730,446

Claims priority, application France, July 13, 1967, 114,307

Int. Cl. C07c 21/04, 21/06, 17/02, 17/04

U.S. Cl. 260—654H 22 Claims



Process of reaction of a mixture of ethylene, chlorine, 1,2-dichloroethane and 1,1,2-trichloroethane to produce 1,1-dichloroethylene, 1,2-dichloroethylenes and vinyl chloride and the combination thereof with an oxychlorination reaction which makes use of components from the dehydrochlorination reaction and which makes available components for the chlorination reaction.

3,594,429

TRICHLOROETHYLENE PREPARED BY OXYCHLORINATION OF VINYLIDENE CHLORIDE

Albert Antonini, Paris, Claude Kaziz, La Courneuve, and Georges Wetroff, Le Thillay, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Paris, France

No Drawing. Filed May 20, 1968, Ser. No. 730,617
Claims priority, application France, May 19, 1967, 106,977
Int. Cl. C07c 17/06, 21/10
U.S. Cl. 260—654A 16 Claims

A process for preparation of trichloroethylene by oxychlorination of vinylidene chloride with a fluid bed catalyst.

3,594,430

ALKYLATION OF AROMATIC HYDROCARBONS

George L. Hervert, Woodstock, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 686,690, Nov. 29, 1967. This application May 25, 1970, Ser. No. 40,455
Int. Cl. C07c 15/02, 15/14
U.S. Cl. 260—668C 10 Claims

The alkylation of aromatic hydrocarbons is effected in the presence of a novel catalyst comprising a hydrogen fluoride-carbon dioxide complex to prepare alkylated aromatic hydrocarbons possessing certain desirable configurations.

3,594,431

CATALYTIC LIQUID PHASE HYDROFLUORINATION OF ALKYNES TO FORM OLEFIN FLUORIDES

Michael J. Maximovich and Henry C. Stevens, Akron, and Fred C. Trager, Barberton, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Jan. 19, 1967, Ser. No. 610,225
Int. Cl. C07c 17/08, 21/18
U.S. Cl. 260—653.4 8 Claims

Described is the catalytic hydrofluorination of acetylenics in a liquid organic medium made up of from 3 to 15 moles hydrogen fluoride per mole of organic base such as N,N-dimethylaniline while evolving olefin monofluoride (the equimolar hydrofluorination product) product from the liquid. Exemplary conditions for maintaining this reaction media composition while evolving the product include 50° C. to 100° C. and 5 to 100 p.s.i.g.

3,594,432

PREPARATION OF CAROTENOID COMPOUNDS

Jacques Morel, Tassin-la-Demi-Lune, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Jan. 15, 1970, Ser. No. 3,208
Claims priority, application France, Jan. 17, 1969, 826
Int. Cl. C07c 5/14
U.S. Cl. 260—666 9 Claims

Retrodehydro-β-carotene is produced in improved yield by brominating β-carotene with N-bromosuccinimide and then dehydrobrominating the resulting 4-bromo - β - carotene in the presence of an alkali metal iodide.

3,594,433

CATALYTIC ISOMERIZATION PROCESS FOR THE PRODUCTION OF 5-ETHYLIDENEBICYCLO[2.2.1] HEPT-2-ENES

Wolfgang Schneider, Brecksville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,987
Int. Cl. C07c 5/24
U.S. Cl. 260—666 9 Claims

5 - vinylbicyclo[2.2.1]hept-2-ene is isomerized to 5-ethylidenebicyclo[2.2.1]hept-2-ene when contacted with a catalyst comprising a titanium compound such as titanium alcoholates and cyclopentadienyl titanium halides with a Group I-A, II-A or III-A or Lanthanide metal or a Group I-A, II-A, III-A or Lanthanide metal in combination with certain Lewis acids. 5-ethylidenebicyclo-[2.2.1]hept-2-ene is a useful comonomer for polymerization with α-olefins such as ethylene and propylene.

3,594,434

PROCESS FOR THE CATALYTIC PREPARATION OF DIVINYLCYCLOBUTANE

Gunther Wilke and Paul Heimbach, Mulheim (Ruhr), and Wolf-Bernd Brenner, Oberhausen, Rhineland, Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

No Drawing. Filed Apr. 3, 1968, Ser. No. 718,376
Claims priority, application Germany, Apr. 8, 1967, St 26,718
Int. Cl. C07c 3/10
U.S. Cl. 260—666 4 Claims

A process for the catalytic dimerisation of 1,3-diolefines is disclosed. Preferred diolefines are butadiene, isoprene and piperylene. The catalysts used are ones formed by mixing a reducible nickel compound and a metal having a reducing action with respect to the reducible nickel compound or a halogen-free organometallic compound, of which metal alkyls, metal aryls or metal hydrides are examples, and an electron donor. They may also be formed by mixing a nickel complex compound which contains O-valent nickel with an electron donor. The electron donor may be an ester of a phosphorous acid or a diolefine. The process is carried out with incomplete conversion of the 1,3-diolefine.

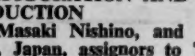
3,594,435

LARGE RING POLY-ENE COMPOUNDS HAVING TRANS CONFIGURATION AND METHOD FOR THEIR PRODUCTION

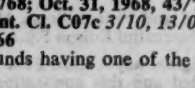
Hisao Kondo, Masaki Nishino, and Akihisa Miyake, Kamakura-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,176
Claims priority, application Japan, Feb. 9, 1968, 43/7,768; Oct. 31, 1968, 43/78,867
Int. Cl. C07c 3/10, 13/02
U.S. Cl. 260—666 8 Claims

Cyclic compounds having one of the following formulas:



or



are described, where n is an integer not less than 4, and the unsaturations of said compounds exhibit trans configurations. These compounds are produced by a process comprising reacting butadiene in the presence of both a nickel-hydrogen coordination complex and a halogenated nickel-hydrocarbon coordination complex.

3,594,436

SEPARATION OF 2,6- AND 2,7-DMN EUTECTIC VIA 2,6-DIMETHYLTETRAHYDRONAPHTHALENE CRYSTALLIZATION

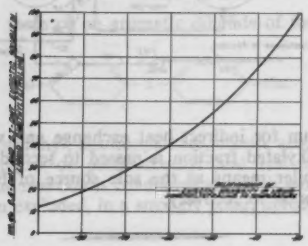
John A. Hedge, Devon, Wilmington, Del., and Kenneth A. Scott, Swarthmore, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

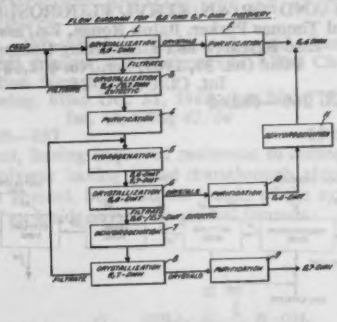
Filed Feb. 3, 1969, Ser. No. 796,078
Int. Cl. C07c 7/14, 15/24
U.S. Cl. 260—674N 10 Claims

Essentially all of the 2,6-dimethylnaphthalene (DMN) contained in the 2,6-/2,7-dimethylnaphthalene eutectic

mixture can be recovered by hydrogenating the eutectic mixture to produce a mixture of 2,6- and 2,7-dimethyltetralin (DMT). The 2,6/2,7-DMT also forms a eutectic, however, it is at a different ratio than the 2,6/2,7-DMN. The shift is in favor of greater 2,7-DMT in the eutectic thus there is free 2,6-DMT that can be recovered from this mixture. 2,6-DMT can be recovered in high yields and high purity by carefully controlling the temperature of crystallization at the lowest temperature determined from FIG. 3 at which all of the 2,6-/2,7-DMT eutectic is soluble in the liquids present. For example, a hydrogenated 2,6-/2,7-DMN eutectic feed containing

	Wt. percent
2,6-DMT	30
2,7-DMT	30
Other liquid aromatics	40





will have a eutectic of 2,6-/2,7-DMT in the weight ratio of .538. Thus, the eutectic represents 46.2% of the incoming feed. To use FIG. 3, the weight percent of eutectic is calculated on total feed excluding the free 2,6-DMT in this case the weight percent of eutectic to be dissolved is calculated to be 53.6 wt. percent. From FIG. 3, 53.6 wt. percent eutectic is soluble at −51° C. The temperature of crystallization should be no less than −51° C. (±2° C.) to avoid crystallization of the 2,6-/2,7-DMT eutectic and no more than −51° C. (± 2° C.) to avoid dissolving free 2,6-DMT.

3,594,437

PURIFICATION OF DIETHYNYLBENZENES

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,923
Int. Cl. C07c *15/02*
U.S. Cl. 260—674R **5 Claims**

Impure diethynylbenzenes are purified by cooling a solution of the material in a liquid alkane, maintaining the temperature of the solution at least as low as −50° C., until the purified diethynylbenzene precipitates from the solution and isolating the precipitate from the solution.

3,594,438

CATALYTIC CONVERSION OF 3-CARENE BY ETA ALUMINA

James O. Bledsoe, Jr., Jacksonville, Fla., assignor to SCM Corporation, New York, N.Y.

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,501
Int. Cl. C07c *5/00*; C09f *3/00*
U.S. Cl. 260—675.5 **9 Claims**

Alumina in the form of eta alumina is used catalytically to convert 3-carene to a mixture of dipentene and carvestrene with increased yields and suppression of undesirable by-products.

3,594,439

ACCELERATORS FOR POLYESTER RESINS

John G. Baker, Cheswick, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Dec. 22, 1967, Ser. No. 692,657
Int. Cl. C08f *21/02*
U.S. Cl. 260—863 **17 Claims**

Polyester resin compositions comprising polyesters of ethylenically unsaturated polycarboxylic acids and polyhydric alcohols and accelerators for the peroxide cure of the polyesters are treated with from about 0.001 to about 0.9 weight percent of the resin of free alkylene glycol having up to 6 carbon atoms to accelerate the gel time of the polyesters. The cured polyester compositions are useful as coatings, castings and laminates.

3,594,440

PROCESS FOR THE PREPARATION OF OLEFINS

Brian Patrick McGrath, Crowthorne, and Keith Vaughan Williams, Shepperton, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed Mar. 11, 1968, Ser. No. 711,878
Claims priority, application Great Britain, Mar. 16, 1967, 12,303/67
Int. Cl. C07c *3/62*
U.S. Cl. 260—683D **15 Claims**

An initial mixture of an acyclic olefin, e.g., butene-2, and an easily polymerisable olefin, e.g., isobutane, is coreacted in the presence of a catalyst comprising rhenium heptoxide on sodium poisoned alumina.

In an example a feedstock containing 6.4% by weight of butene-1, 42.4% of isobutene and 51.2% of butene-2 was passed over a catalyst at 20° C., 150 p.s.i.g. and a LHSV of 10. The catalyst was prepared by fluidising ammonium perrhenate onto alumina which had been treated with a 0.25 N solution of sodium bicarbonate. The catalyst contained 14% by weight of rhenium heptoxide and 0.25% by weight sodium ion. The reaction products, expressed as grams per 100 gram feed, were as follows, ethylene 0.4; propylene, 16.7; butene-1, 1.3; isobutene, 25.7; butene-2, 32.9; n-pentenes, 4.2; isopentenes, 18.3; and polymer, 0.4.

3,594,441

PRODUCTION OF HEPTENES

John Grebbell, Send, near Woking, and Kuldar Heljula, Twickenham, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed June 19, 1968, Ser. No. 738,107
Claims priority, application Great Britain, June 22, 1967, 28,801/67
Int. Cl. C07c *3/20*
U.S. Cl. 260—683.15 **14 Claims**

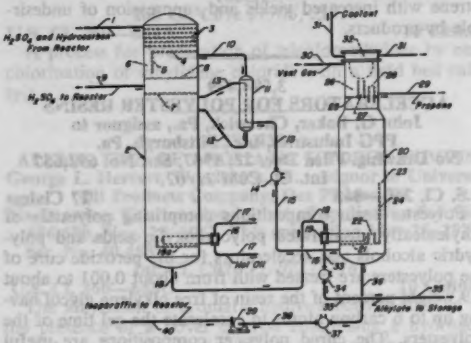
Heptenes are produced by codimerising propylene and a butene at an elevated temperature over a catalyst prepared by dispersing sodium and/or lithium on anhydrous potassium carbonate, the catalyst being treated by either (a) incorporating a minor molar proportion of hydrogen in the feed for at least part of the time for which the feed is passed or (b) removing the feed and contacting the catalyst with hydrogen in the absence of the feed at a temperature in the range 50 to 350° C. The catalyst is preferably hydrided before use.

3,594,442

SEPARATION OF REACTOR EFFLUENT FROM SULFURIC ACID ALKYLATION PROCESS

Edwin K. Jones, Kenilworth, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 9, 1969, Ser. No. 831,330
Int. Cl. C07c 3/54; B01d 3/00
U.S. Cl. 260—683.62 5 Claims



Process for separating hydrocarbons and sulfuric acid catalyst from the total sulfuric acid-hydrocarbon effluent of an isoparaffin-olefin alkylation reaction zone in a processing system wherein a vapor fraction comprising propane and isoparaffinic hydrocarbons is partially condensed in an external heat exchanger means utilizing hydrocarbon separated in a first separation zone as the medium for indirect heat exchange and wherein the desired alkylated fraction is passed to second separation zone reboiler means as the sole source of heat to this reboiler prior to recovery.

3,594,443

PROCESS FOR PREPARING LOW MOLECULAR WEIGHT α-OLEFINS

Gisela Henrici Henrici and Salvador Olivé Martin, Zollikerberg, Switzerland, assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 2, 1969, Ser. No. 821,495
Claims priority, application Switzerland, May 13, 1968, 7,420/68
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 6 Claims

Process for preparing low molecular weight α-olefins having 4 to 50 carbon atoms by reacting ethylene in presence of a solution in an aromatic solvent $RAlCl_2$ and $(RO)_3TiCl$ where R is a 1 to 4 carbon alkyl, the Al to Ti molar ratio is in the range of 2:1 to 10:1, at a temperature in the range of 0 to −50° C., preferably −10 to −50° C., at a pressure in the range of 1 to 20 kg./cm.² and preferably at a titanium compound concentration of 1×10^{-3} to 50×10^{-3} mol/liter of solvent.

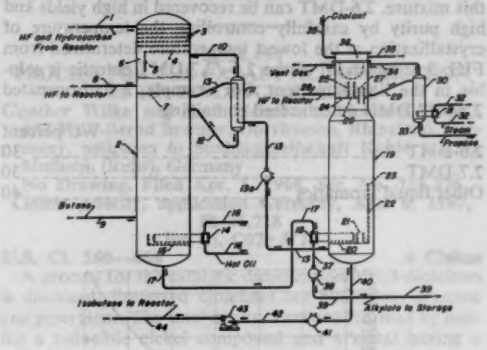
3,594,444

PROCESS FOR SEPARATING HYDROCARBONS AND HYDROGEN FLUORIDE CATALYST FROM THE EFFLUENT OF AN ISOPARAFFIN-OLEFIN ALKYLATION REACTION ZONE

Edwin K. Jones, Kenilworth, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 9, 1969, Ser. No. 831,618
Int. Cl. C07c 3/54; B01d 3/00
U.S. Cl. 260—683.48 6 Claims

Process for separating hydrocarbons and hydrogen fluoride catalyst from the total hydrogen fluoride-hydrocarbon effluent of an isoparaffin-olefin alkylation reaction zone in a processing system wherein a vapor fraction comprising propane and isoparaffinic hydrocarbons is partially condensed in an external heat exchanger means utilizing hydrocarbon separated in a first separation zone as



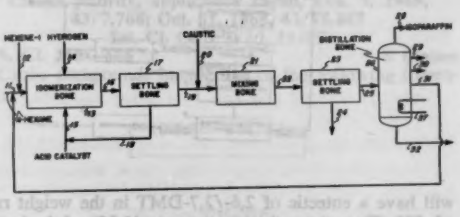
the medium for indirect heat exchange and wherein the desired alkylated fraction is passed to second separation zone reboiler means as the sole source of heat to this reboiler prior to recovery.

3,594,445

ISOMERIZATION OF PARAFFINIC HYDROCARBONS EMPLOYING HYDROGEN WITH AN OLEFIN AND/OR AN ALKYL FLUOROSULFONATE

Paul Thomas Parker, Baton Rouge, La., assignor to Esso Research and Engineering Company

Filed Oct. 30, 1969, Ser. No. 872,687
Int. Cl. C07c 5/28
U.S. Cl. 260—683.68 10 Claims



In the isomerization of normal and naphthenic paraffins with a catalyst comprised of (1) a Group V metal fluoride such as antimony pentafluoride and (2) fluorosulfonic acid, the improvement wherein the formation of undesirable products by disproportionation is suppressed by employing hydrogen gas with an olefin and/or an alkyl fluorosulfonate such as ethyl fluorosulfonate.

3,594,446

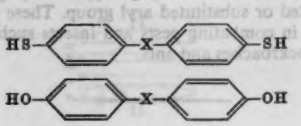
HEAT-RESISTANT, LINEAR, AROMATIC COPOLYMERS AND PROCESS FOR THEIR PRODUCTION

Rudolf Gabler, Uitikon, and Josef Studinka, Zurich, Switzerland, assignors to Inventa A.G. fur Forschung und Patentverwertung, Zurich, Switzerland

No Drawing. Filed Feb. 26, 1969, Ser. No. 802,635
Claims priority, application Switzerland, Feb. 29, 1968, 3,005/68
Int. Cl. C08g 23/00, 33/00
U.S. Cl. 260—823 17 Claims

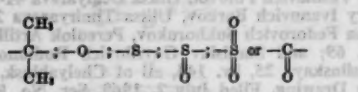
Heat-resistant, linear, aromatic copolymers containing thioether groups and ether groups as polymer forming

connecting links, produced by reacting (a) 0.9–1.1 mole of a mixture of sodium or potassium salts of at least one aromatic dithiol and one aromatic diphenol of the formulae:



and

where X is $-CH_2-$;



with (b) 1 mole of an aromatic dihalide of the formula

where Y is sulfonyl, disulfonyl, keto, diketo, azo, vinylene, alkyl phosphine or perfluoroethyl and Hal stands for halogen. The reaction is conducted at a high temperature, with oxygen excluded, in a strongly polar, aprotic solvent.

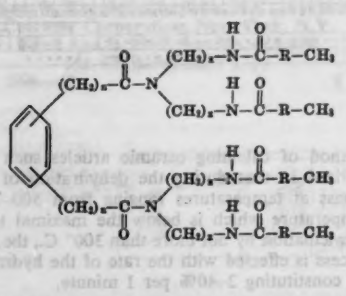
3,594,447

POLYAMIDES AND POLYESTERS CONTAINING ISOPHTHALATE AMIDES OF DIALKANOYL POLYALKYLENE POLYAMINES AS ANTISOILING AGENTS

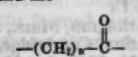
Robert C. Winckilhofer, Richmond, and Lamberto Crescentini, Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 31, 1968, Ser. No. 772,383
Int. Cl. C08g 41/04
U.S. Cl. 260—857 13 Claims

A filament, having improved resistance to soiling, of a synthetic polymer having mixed therethrough about 0.02 to 5 weight percent, based on the weight of the synthetic polymer, of an amide having the general formula:



wherein the hexagon represents the benzene nucleus, R is a divalent radical containing up to about 30, preferably about 3 to 18, carbon atoms which can be linear or branched aliphatic, *n* is an integer from 0 to about 6 but preferably is 0, *x* is an integer from 1 to about 6 but preferably is about 2 to 3, and the



radicals connected to the benzene nucleus are relatively disposed in the ortho, meta, or para positions but preferably in the meta position.

3,594,448

FILAMENT COMPRISING A POLYMER BLEND OF POLYESTER AND POLYAMIDE CONTAINING A STERICALLY HINDERED PHENOLIC COMPOUND

Amnon Birenzvige, Gene C. Weedon, and Richard E. Mayer, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Apr. 16, 1969, Ser. No. 816,840
Int. Cl. C08g 41/04
U.S. Cl. 260—857 16 Claims

A process for increasing the whiteness of a filament extruded from a polymer blend comprised of polyester and polyamide which comprises incorporating in the polymer blend, prior to extrusion thereof, about 0.1 to 5 weight percent, based upon the weight of the polyamide and polyester, of a sterically hindered phenolic compound and melt extruding the polymer blend to form a filament having increased whiteness.

3,594,449

POLYURETHANE CROSS-LINKED CHLORINATED POLYETHYLENES

Charles R. Binder, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

No Drawing. Filed Sept. 15, 1969, Ser. No. 858,145
Int. Cl. C08g 41/04
U.S. Cl. 260—859 3 Claims

A mixture containing 50 to 80 parts, by weight, chlorinated polyethylene, 20 to 50 parts, by weight, of an isocyanate terminated prepolymer and sufficient organic diamine to provide a slight excess of amine groups over isocyanate groups is readily moldable and will co-react at normal molding temperatures to form a polyurethane cross-linked chlorinated polyethylene having high strength and other desirable physical properties.

3,594,450

THERMOPLASTIC POLYESTER MOULDING COMPOSITIONS CONTAINING DIENE-ACRYLATE COPOLYMER

Walter Herwig and Ludwig Brinkmann, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 16, 1968, Ser. No. 745,114
Claims priority, application Germany, Aug. 30, 1967, F 53,355
Int. Cl. C08g 39/04
U.S. Cl. 260—873 10 Claims

Thermoplastically workable moulding compositions of particularly high impact strength, comprising a mixture of saturated linear polyesters with copolymers of conjugated aliphatic dienes and acrylic acid esters.

3,594,451

CHLOROSULFONATED POLYETHYLENE GRAFT POLYMERS

Robert William Keown, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 26, 1967, Ser. No. 678,210
Int. Cl. C08f 15/00
U.S. Cl. 260—878 9 Claims

An elastomeric graft polymer of an amorphous, homogeneously chlorosulfonated polyethylene having grafted thereon polymer chain units derived from the monomers styrene, vinyl chloride, chlorostyrene, lower-alkyl substituted styrene, vinylidene chloride, methacrylonitrile, lower-alkyl methacrylates, or a mixture of 2,3-dichlorobutadiene-1,3 and chloroprene, the weight of said poly-

mer chain units being from 10% to 40% (preferably 15% to 30%) of said graft polymer, and said chlorosulfonated polyethylene containing 0.5 to 5 (preferably 1 to 2) weight percent sulfur and 25 to 45 (preferably 28 to 35) weight percent chlorine.

ERRATUM

For Class 260—880 see:
Patent No. 3,594,543

3,594,452

POLYMERS PREPARED FROM MONOLITHIUM-TERMINATED BLOCK COPOLYMERS AND CERTAIN DIESTERS

Harold E. De La Mare, El Cerrito, and Edwin F. Bullard, Oakland, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Feb. 6, 1968, Ser. No. 703,239
Int. Cl. C08f *15/14, 27/00*
U.S. Cl. 260—880 **7 Claims**

Block polymers of high molecular weight result from the reaction of styrene-butadiene block copolymers terminated with lithium radicals and diesters of dicarboxylic acids in which each of the two carboxyl radicals is directly attached to a carbon atom and monohydric alcohols.

3,594,453

METHOD OF PRODUCING ALPHA-METHYLSTYRENE RESIN

Carmen M. Cusano, Poughkeepsie, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed July 25, 1968, Ser. No. 747,485
Int. Cl. C08f *15/04, 1/13*
U.S. Cl. 260—880 **5 Claims**

A method of producing a synthetic graft polymer resin at an improved rate under aqueous emulsion polymerization conditions comprising polymerizing an aqueous dispersion of a member selected from the group consisting of butadiene and a mixture of butadiene and methacrylic acid to form a first polymer selected from the group consisting of polybutadiene and poly(butadiene-methacrylic acid) and polymerizing an aqueous latex of the first formed polymer together with alpha-methylstyrene, and acrylonitrile under aqueous emulsion polymerization conditions to form a synthetic resin composed of a polybutadiene or poly(butadiene-methacrylic acid) backbone having grafted thereon alpha-methylstyrene and acrylonitrile copolymers, said polymerizations being conducted in the presence of a quaternary ammonium chloride cationic emulsifier at a pH between about 6 and 8.

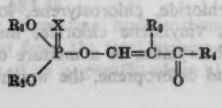
3,594,454

2 - ALKOXYCARBONYL - 2 - CHLORO OR LOWER ALKYL VINYL DILOWERALKYL PHOSPHATES

Ernst Beriger, Allschwil, and Ladislaus Pinter, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed July 24, 1967, Ser. No. 655,289
Claims priority, application Switzerland, July 25, 1966, 10,735/66
Int. Cl. C07f *9/08;* **A01n** *9/36*
U.S. Cl. 260—941 **9 Claims**

Compounds of the formula



in which R_1 and R_2 are identical or different lower alkyl groups, X is an oxygen or a sulphur atom, R_3 represents a hydrogen atom, an alkyl group or a halogen atom and R_4 represents a lower alkoxy group, an alkyl group or an unsubstituted or substituted aryl group. These compounds are useful in combating pests and insects such as beetles, crickets, cockroaches and ants.

3,594,455

METHODS FOR MANUFACTURING CARBON AND/OR GRAPHITE MATERIALS

Boris Vasilievich Polovoi, Ulitsa Degtyareva 41-a, kv. 33; Jury Ivanovich Barkov, Ulitsa Timiryazeva 28, kv. 1; Ivan Fedorovich Sukhorukov, Pereulok Artillerilsky 6, kv. 69; and Stanislav Gavrilovich Rodionov, Ulitsa Kasiinskaya 25, kv. 148, all of Chelyabinsk, U.S.S.R.

No Drawing. Filed July 2, 1969, Ser. No. 838,649
Int. Cl. C01b *31/08*
U.S. Cl. 263—52 **10 Claims**

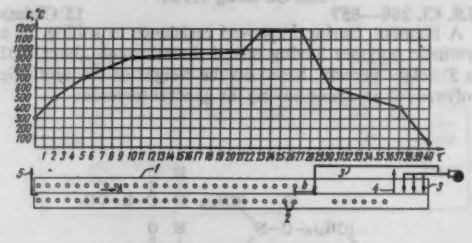
Carbon and/or graphite materials having high density and mechanical strength are prepared by impregnation of a solid carbonaceous material with a solution of a chemically active compound which is an inorganic compound containing nickel, manganese, barium, sulfur or NO_3, NO_2, ClO_3 or ClO_4 groups or an organic compound containing nitro, phenol, peroxide or acid groups, followed by impregnation with a fluid carbonaceous material, e.g. coal tar pitch, and heat treatment.

3,594,456

METHOD OF CALCINING CERAMIC ARTICLES

Peisya Iosifovich Berenshtein, Ulitsa Institutskaya 22a, kv. 4, Saltykovka Moskovskaya Oblast, U.S.S.R.

Filed Jan. 14, 1970, Ser. No. 2,801
Int. Cl. B01j *6/00*
U.S. Cl. 263—52 **3 Claims**



A method of calcining ceramic articles such as tiles characterized in that during the dehydration of the ceramic mass at temperatures ranging from 500–700° C. to a temperature which is below the maximal temperature of calcination by not more than 300° C., the calcination process is effected with the rate of the hydrate mass removal constituting 2–40% per 1 minute.

3,594,457

METHOD OF PRESS FORMING BIREFRINGENT TRANSPARENT POLYETHYLENE TEREPHTHALATE SHEETS

Richard F. Wright, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 12, 1967, Ser. No. 645,237
Int. Cl. B29d *11/00;* **B29c** *1/04*
U.S. Cl. 264—1 **12 Claims**

This disclosure concerns a process for press-forming lenticular or prismatic configurations in one side of a

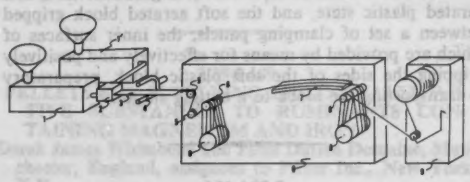
sheet of dimensionally stable material, such as a polyethylene terephthalate composition of the type commonly

known as Mylar, and the improved optical device produced thereby.

3,594,458
METHOD OF PRODUCING POLYVINYL FLUORIDE WEBS
George N. Foster, Somerville, and William Sacks, Gillette, N.J., assignors to Union Carbide Corporation
No Drawing. Filed Nov. 24, 1967, Ser. No. 685,336
Int. Cl. B29c *25/00;* B29d *7/24*
U.S. Cl. 264—22 6 Claims

Vinyl fluoride polymer webs including film, in the absence of solvent can upon irradiation and heating to orientation temperature, be readily biaxially oriented, in tubular or nontubular form, to a clear, durable web.

3,594,459
PROCESS FOR THE PRODUCTION OF CONJUGATE FOAM FIBRILLATED STRUCTURES
Herbert W. Keuchel, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.
Filed Apr. 3, 1967, Ser. No. 628,030
Int. Cl. B29d; B29f *3/10*
U.S. Cl. 264—47 5 Claims

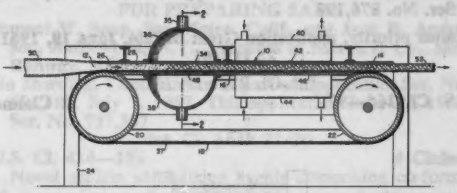


Processes for the preparation of conjugate fibrillated extrudates and the products produced thereby, the process involving extruding a conjugate extrudate, at least one component of said extrudate containing a foaming agent and then attenuating the foamed extrudate. Attenuation of the extrudate encompasses processes wherein said extrudate is maintained at temperatures sufficiently high to inhibit orientation and produce fibrillation while the polymer is in unoriented configuration and processes wherein the extrudate is cooled to a temperature sufficiently low to induce orientation, oriented and fibrillated.

3,594,460
METHOD FOR PREPARING A LABORATORY COUNTER TOP
Harold L. Rechter, Chicago, and Murray A. Schwartz, Glencoe, Ill., assignors to E. H. Sheldon & Company, Muskegon, Mich.
No Drawing. Filed Aug. 5, 1968, Ser. No. 750,013
Int. Cl. B29h *7/20*
U.S. Cl. 264—48 3 Claims

A non-warping inorganic counter top sufficiently plastic and tough to permit cutting and bolting in the field, while at the same time being heat and acid resistant, is prepared by extruding, pressing or casting a sand, bentonite and silicate mixture into the desired counter top form and then sealing the pores in the upper portion of the top with epoxy novolak resin and curing the resin.

3,594,461
METHOD AND APPARATUS FOR CONTINUOUSLY MOLDING SHEETS FROM EXPANDABLE POLYMERIC MATERIALS
Francis J. Jacob, New Castle, Pa., assignor to W. R. Grace & Co., Cambridge, Mass.
Filed Jan. 21, 1969, Ser. No. 792,312
Int. Cl. B29c *5/00, 5/10;* B29d *7/14*
U.S. Cl. 264—51 16 Claims

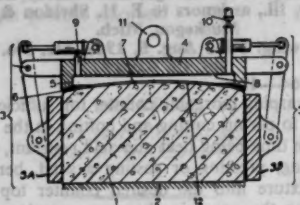


An apparatus and method for continuous molding of heat expandable thermoplastic granules into an agglutinated body including an open-ended molding channel which has only a single moving surface for conveying the agglutinated continuous body formed after the application of heat to the granules. The single moving surface is preferably a woven wire belt or equivalent which is foraminous over its entire width. The apparatus also includes a means for adjusting the height of the molding channel while the machine is in operation. Means are provided for evacuating feed air or heating fluid from the molding channel between feeding and heating of the granules.

3,594,462
METHOD OF MAKING ARTICLES FROM MATERIAL IN A PLASTIC STATE
Berend Vrijma, Vuren, Netherlands, assignor to Fabriek van Bouwmaterialen "Loevestein" N.V., Gorinchem, Netherlands
Continuation-in-part of application Ser. No. 523,183, Jan. 26, 1966. This application May 13, 1969, Ser. No. 824,228
Claims priority, application Netherlands, Feb. 3, 1965, 6501347
Int. Cl. B28b *13/06*
U.S. Cl. 264—90 2 Claims

The method is provided wherein a block of material in the plastic state, e.g. lightweight concrete, is prepared in a mould, is transferred by a lifting device from the bottom of the mould to a cutting table, the opposite sides of the block being supported by panels or clamping jaws. At the cutting station, the block is cut into pieces and allowed to set. The method is characterized by the use

of suction means, whereby a lifting suction is applied to the top surface of the block to aid in lifting the block



in a relatively soft state without destroying it during transport.

3,594,463

PROCESS FOR INJECTION-BLOW MOLDING HOLLOW ARTICLES

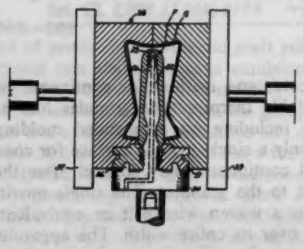
Borge Hestehave, 3148 Padre St., Lafayette, Calif. 94549

Continuation of application Ser. No. 689,563, Dec. 11, 1967, which is a division of application Ser. No. 203,569, June 19, 1962. This application Nov. 28, 1969, Ser. No. 876,190

Claims priority, application Great Britain, June 19, 1961, 22,115/61

Int. Cl. B29c *17/17*

U.S. Cl. 264—97 2 Claims



A method of manufacturing hollow articles of synthetic resinous material which comprises the steps of injection-molding a parison and integral neck portion, withdrawing the mandrel together with the parison mold thereon in the axial direction relative to the parison mold while maintaining the neck mold portion closed over the neck, transferring the mandrel to a blow mold together with the closed neck portion, blowing the article in the blow mold and thereafter opening the neck mold and removing the article.

3,594,464

METHOD FOR SCORING SYNTHETIC PLASTIC SHEET MATERIAL

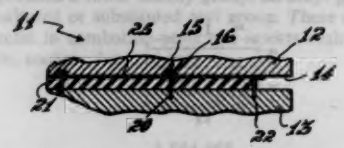
Richard C. Ihde, Parma Heights, Ohio, assignor to U.S. Plywood-Champion Papers Inc., Hamilton, Ohio

Filed Jan. 31, 1968, Ser. No. 702,082

Int. Cl. B29c *1/14, 17/02*

U.S. Cl. 264—163 12 Claims

A process for scoring synthetic plastic sheet material by permanently distorting the sheet material in an area defining a score line or lines to form the scored sheet. The sheet material is also shaped in peripheral areas by



cutting through its thickness to form a scored blank useful for fabricating containers and the like.

3,594,465

METHOD FOR THE PRODUCTION OF ARTICLES FROM MATERIAL IN A PLASTIC STATE

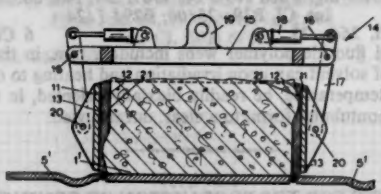
Berend Vrijma, Vuren, Netherlands, assignor to Fabriek van Bouwmaterialen "Loevestein" N.V., Gorinchen, Netherlands

Continuation-in-part of abandoned application Ser. No. 523,184, Jan. 26, 1966. This application May 19, 1969, Ser. No. 825,626

Claims priority, application Netherlands, Feb. 3, 1965, 6501346

Int. Cl. B28b *13/06*

U.S. Cl. 264—313 2 Claims



A method is disclosed for making articles from material in the soft plastic state, such as lightweight concrete, wherein an aerated concrete mix is poured into a mould, the mix allowed to set to form a large block in a soft aerated plastic state, and the soft aerated block gripped between a set of clamping panels, the inner surfaces of which are provided by means for effectively and positively gripping the sides of the soft plastic block, preparatory to transporting the block to a cutting station.

3,594,466

IMMUNOLOGICAL TEST SYSTEM AND PROCESS FOR PREPARING SAME

René Auguste Denis Guffroy, Lille, Nord, France, assignor to Laboratoires Polypharma, Ile-Saint-Denis, Seine-Saint-Denis, France

No Drawing. Filed Oct. 24, 1966, Ser. No. 588,747

Claims priority, application France, Apr. 19, 1966, 58,156

Int. Cl. G01n *33/16*

U.S. Cl. 424—12 5 Claims

A stable diagnostic for rheumatoid arthritis is provided by processing red blood cells, processing a hemolytic

antiserum to the red cells, and formolating and combining the red cells and the hemolytic antiserum.

3,594,467
LONG-LASTING TROCHE

George L. Christenson, Cincinnati, and Harold E. Huber, Goshen, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

Filed Oct. 9, 1968, Ser. No. 766,291
Int. Cl. A61k *27/12*
U.S. Cl. 424—19 8 Claims

A compressed powder, long-lasting, troche containing 4% to 17% of carboxypolymethylene, 15% to 70% of sodium caseinate and from about 13% to 81% of a water-soluble pharmaceutically acceptable tabletting diluent.

3,594,468
GERMICIDAL COMPOSITIONS

Vincent R. Saurino, 708 NW. 5th St., Boca Raton, Fla. 33432, and Vladimir Tuma, 416 NW. 2nd Ave., Boynton Beach, Fla. 33435

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,303
Int. Cl. A61l *23/00*
U.S. Cl. 424—25 17 Claims

Broadly stated, the present spermicidal and germicidal compositions comprise, in combination, the following ingredients:

(A) 2[(2-hydroxy-5-nonyl-benzyl)-methylamino]ethane sulfonic acid and the pharmaceutically acceptable salts thereof (hereinafter referred to as the unsubstituted sulfonic acid),

(B) {[3 - (dimethyl - amino - methyl) - 2 - hydroxy - 5 - nonyl-benzyl]methyl-amino}ethane sulfonic acid and the pharmaceutically acceptable salts thereof (hereinafter referred to as the substituted sulfonic acid),

(C) Coco-benzyl-dimethyl ammonium halide, e.g. the chloride, bromide and iodide, and especially the chloride.

The above composition have been found to be biologically active against a wide range of organism including the venereal type organisms such as *Neisseria gonorrheae, Treponema pallidum* and other spirochetes, *Hemophilus ducreyli,* flagellates, such as *Trichomonas vaginalis* and related organisms.

The compositions exhibit unexpected and unusual properties of being spermicidal and, therefore, are particularly useful as a contraceptive which also controls and/or prevents infection with venereal disease organisms, e.g. *Neisseria gonorrhea* and *Treponema pallidum.*

3,594,469
PELLETS FOR SUPPLYING BIOLOGICALLY ACTIVE SUBSTANCES TO RUMINANTS CONTAINING MAGNESIUM AND IRON

Derek James Whitehead and Peter Darien Demaine, Manchester, England, assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 23, 1965, Ser. No. 509,265
Claims priority, application Great Britain, Nov. 30, 1964, 48,589/64
Int. Cl. A61j *3/00, 3/07, 3/08*
U.S. Cl. 424—22 13 Claims

Pellets for administration to ruminants for supplying the animals over an extended period of time with biologically active substances selected from the group consisting of magnesium and magnesium base alloys, together with particles of a metallic substance non-harmful to ruminants and of a higher specific gravity than that of said biologically active substance, said biologically active substance and said particles being in such proportions that the pellet has a specific gravity of at least 2.2.

3,594,470
CHEWABLE TABLETS INCLUDING COATED PARTICLES OF PSEUDOEPHEDRINE-WEAK CATION EXCHANGE RESIN

Saul Borodkin, Libertyville, and Dean Paul Sundberg, Lake Forest, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Feb. 19, 1968, Ser. No. 706,679
Int. Cl. A61k *9/00*
U.S. Cl. 424—32 8 Claims

Pharmaceutical tablets containing basic-reacting drugs are made chewable and palatable by adsorbing the drug on a weak cation exchange resin of specific particle size and coating these particles thereafter but before tableting.

3,594,471
NOVEL ADJUVANT VACCINE AND METHOD OF PRODUCING THE SAME

Ellis Hertzberger, Weesp, and Roderick Louis Stephens, Amsterdam, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,509
Claims priority, application England, Nov. 13, 1967, 51,507/67
Int. Cl. C12k *5/00*
U.S. Cl. 424—89 8 Claims

An adjuvant vaccine is provided wherein a dry antigenic material is dispersed in a dry oily vehicle.

3,594,472
ASPIRIN SOLUBILIZING AGENT AND METHOD FOR PREPARING SAME

Samuel W. Sopp, San Mateo, Calif., and Jack R. Anderson, Ridgewood, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 651,687, July 7, 1967. This application June 17, 1968, Ser. No. 737,357
Int. Cl. A61k *27/00*
U.S. Cl. 424—156 4 Claims

Novel aspirin solubilizing agents comprising co-forms of magnesium and calcium carbonate or hydroxy carbonate are prepared from magnesium hydroxide and calcium hydroxide. Compositions containing aspirin combined with co-forms of magnesium and calcium carbonate or hydroxy carbonate.

3,594,473
ANTI-HAEMORRHOIDALLY ACTIVE PREPARATIONS AND THE USE OF A D-GLUCOFURANOSIDE IN SUCH PREPARATIONS

Alfred Hunger and Anne-Marie Ory, Basel, and Max Schrenzel, Munchenstein, Switzerland, assignors to Ciba Corporation, Summit, N.J.

No Drawing. Filed July 8, 1969, Ser. No. 840,023
Claims priority, application Switzerland, July 19, 1968, 10,817/68
Int. Cl. A61j *3/04, 9/02, 9/06*
U.S. Cl. 424—180 20 Claims

The invention provides anti-haemorrhoidally active preparations for rectal or local administration containing ethyl-3,5,6-tri-O-benzyl-D-glucofuranoside.

3,594,474
GRANULAR MATERIAL CONTAINING OILY OR LIQUID THERAPEUTICALLY USABLE FURANOSIDES, A PROCESS FOR ITS MANUFACTURE, AND ITS USE FOR THE MANUFACTURE OF TABLETS OR DRAGEES

Guenther Mueller, Arlesheim, Switzerland, assignor to Ciba Corporation, Summit, N.J.

No Drawing. Filed July 25, 1969, Ser. No. 845,038
Claims priority, application Switzerland, Aug. 5, 1968, 11,704/68
Int. Cl. A61j *3/06, 3/10*
U.S. Cl. 424—180 8 Claims

The invention provides a process of manufacture of a free-flowing, solid, granular material, wherein an oily or

liquid, therapeutically usable furanoside, such as ethyl-3,5,6-tri-O-benzyl-D-glucofuranoside or ethyl-3-O-propyl-5,6-di-O-para-chlorobenzyl - D - glucofuranoside, is mixed with a film-forming agent and a lower alkanol, the mixture is worked up with magnesium trisilicate to form a plastic mass and the latter granulated while drying it; the free-flowing granular material obtained by this process and the use thereof to form tablets or dragées containing said furanoside.

3,594,475

METHOD OF TREATING AND PREVENTING THE SIDE EFFECTS OF ANTIBIOTICS

Masatoyo Akiyoshi, Yokohama, Kiichi Satoh, Tokorozawa-shi, and Ken Hamaguchi, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Sept. 11, 1968, Ser. No. 759,017
Claims priority, application Japan, Apr. 24, 1968, 43/27,045
Int. Cl. A61k *21/00*
U.S. Cl. 424—181 14 Claims

The present disclosure is directed to a method of treating and preventing the adverse side effects resulting from the administration of antibiotics such as streptomycin, kanamycin, etc., in treating diseases such as tuberculosis which comprises treating said diseases with said antibiotics together with an effective amount of nicotinamide adenine dinucleotide. Among the side effects resulting from the administration of said antibiotics, hearing impairment is frequently included. The nicotinamide adenine dinucleotide can be administered to a patient already affected by the side effects resulting from a previous treatment with antibiotics or can be administered together with the particular antibiotic to prevent the said side effects.

3,594,476

SUBMICRON AQUEOUS AEROSOLS CONTAINING LECITHIN

Edward W. Merrill, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

No Drawing. Filed May 12, 1969, Ser. No. 823,972
Int. Cl. A61j *3/02*; A61k *13/00*
U.S. Cl. 424—199 4 Claims

Aerosols of aqueous particles of submicron diameter which are stable against evaporation and suitable to be readily transmitted to the alveoli of the lung by inspiration, may be prepared from aqueous lecithin dispersions nebulized, as by an ultrasonic nebulizer, at temperatures greater than about 25° C. Lecithin aerosols thus prepared are useful for the treatment of lung disorders, and may optionally contain other therapeutic agents such as antibiotics.

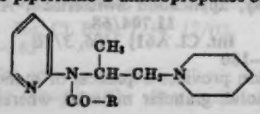
3,594,477

OPTICALLY ACTIVE PYRIDINE DERIVATIVES IN PHARMACEUTICAL COMPOSITIONS AND THEIR USE AS ANALGESICS AND STIMULANTS

Hartmund Wollweber and Rudolf Hiltmann, Wuppertal-Elberfeld, Friedrich Hoffmeister, Wuppertal-Vohwinkel, and Hans-Güenther Kroneberg, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer AG, Leverkusen, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 566,255, July 19, 1966. This application Jan. 14, 1969, Ser. No. 791,135
Claims priority, application Germany, July 24, 1965, F 46,713
Int. Cl. A61k *27/00*
U.S. Cl. 424—263 16 Claims

Dextro-rotatory and levo-rotatory isomers of N-acyl-N-(2'-pyridyl)-1-piperidino-2-aminopropanes of the formula:



wherein R is methyl or ethyl or a pharmaceutically acceptable non-toxic acid salt thereof exhibit pharmaceutical properties which differ qualitatively from the racemate. The L-isomer exhibits approximately the same analgesic activity as the racemate but also exhibits a strong sedative effect. The D-isomer exhibits approximately the same analgesic activity as the racemate but exhibits also a central nervous system stimulant effect.

3,594,478

PHARMACEUTICAL COMPOSITIONS CONTAINING BENZOTHIOPHENE DERIVATIVES

Arne Elof Brandstrom, Goteborg, and Stig Ake Ingemar Carlsson, Molnlycke, Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

No Drawing. Division and Continuation-in-part of application Ser. No. 553,016, May 31, 1966. This application Nov. 24, 1969, Ser. No. 879,516
Claims priority, application Sweden, June 1, 1965, 7,128/65
Int. Cl. A61u *27/00*
U.S. Cl. 424—248 16 Claims

Benzothiophene derivatives having the structural formula described below, a method for their preparation and pharmaceutical preparations containing them. These preparations are useful as analgesic, antipyretic, antiinflammatory, antitussive agents, as local anaesthetics and antispasmodic and antihistaminic agents. They have these properties combined with relatively low toxicity. They may, therefore, be used for the relief of pain, inflammation, pyresis of various origins, or tussive irritation.

3,594,479

COMPOSITION AND METHOD FOR PREVENTING BRONCHOSPASMS USING PYRAZINE DERIVATIVES

John Anthony Maguire and Francis Leslie Rose, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Original application Jan. 2, 1968, Ser. No. 694,816. Divided and this application Jan. 29, 1970, Ser. No. 12,534
Claims priority, application Great Britain, Feb. 3, 1967, 5,356/67
Int. Cl. A61v *27/00*
U.S. Cl. 424—250 2 Claims

Novel s-triazolo[4,3-a]pyrazine derivatives bearing alkyl substituents in the pyrazine ring and an amino, hydroxy, acetamido or formamido substituent in the triazole ring, which prevent bronchospasm and are useful in the treatment of asthma.

3,594,480

NITROGEN HETEROCYCLES FOR THERAPEUTIC ADMINISTRATION

Timothy H. Cronin, Niantic, and Hans-Jurgen E. Hess, Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Application Oct. 26, 1967, Ser. No. 678,191, now Patent No. 3,517,005, which is a continuation-in-part of application Ser. No. 590,494, Oct. 31, 1966. Divided and this application Mar. 12, 1970, Ser. No. 19,082
Int. Cl. A61k *27/00*
U.S. Cl. 424—250 23 Claims

Substituted 6,7-dialkoxyquinazolines, 4-(6,7-dialkoxyquinolin-4-yl)-piperazine-1 - carboxylic acid, esters and 1-amino-6,7-dialkoxyisoquinolines and their pharmaceutically-acceptable acid addition salts. Compounds manifest bronchodilator activity and antihypertensive response with minimal adverse effects upon administration to afflicted subjects.

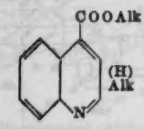
3,594,481

METHOD FOR THE PROTECTION OF PEOPLE AND ANIMALS FROM BITING AND BLOOD SUCKING INSECTS

Ulf Hendrik Anders Lindberg, Sodertalje, Sweden, and Guy Henry Yeoman, Cuffley, England, assignors to Aktiebolaget Astra, Sodertalje, Sweden

No Drawing. Filed June 7, 1967, Ser. No. 644,080
Claims priority, application Sweden, June 15, 1966, 8,199/66
Int. Cl. A01n 9/22
U.S. Cl. 424—258 5 Claims

Insect repellants containing relatively nonvolatile esters of alkyl cinchoninic acids of the formula



effective over a long time, particularly against ovipositing, biting, or blood sucking pests as blowflies, mosquitoes, biting flies, fleas, chiggers, ticks and mites, and being non-irritating and easy to apply with the hands or a swab or as a spray, relatively insoluble in water and free from odour, and especially such odours as may be regarded as unpleasant or disagreeable, and difficult to mask. Preferably, also, the repellant has little or no solvent action on various finishes, paints, varnishes, lacquers, plastics, synthetic fibres, and the like.

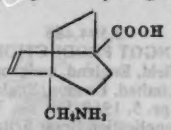
3,594,482

METHOD OF TREATING A PATHOLOGICAL FIBRINOLYTIC STATE IN MAMMALS

Larry J. Loeffler, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Feb. 28, 1968, Ser. No. 708,769, now Patent No. 3,526,657, dated Sept. 1, 1970. Divided and this application July 28, 1969, Ser. No. 872,786
Int. Cl. A61k 27/00
U.S. Cl. 424—319 1 Claim

The method of treating a pathological fibrinolytic state in mammals which involves the daily oral administration of from 1 to 20 mg./kg. of body weight of the compound:



3,594,483

METHOD OF FUNGUS CONTROL EMPLOYING CERTAIN FLUORINE-CONTAINING SULFIDES

Edward L. Mutsch, Woodbury Township, Washington County, and Jerold W. Bushong, North Oaks, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Apr. 29, 1968, Ser. No. 725,125
Int. Cl. A01n 9/12
U.S. Cl. 424—337 8 Claims

Method for inhibiting the growth of fungi, particularly *Sclerotium rolfsii*, by contacting the fungi with a compound of the formula:

$$Ar—alk—S—CH_2—(CF_2)_m—X$$

wherein Ar is phenyl, substituted phenyl, naphthyl or substituted naphthyl, the substituents being lower alkyl, lower alkoxy, halo or nitro; —alk— is an alkylene group, being straight or branched chain, or cyclic and containing from 1 to 6 carbon atoms; *m* is an integer of from 1 to 8, preferably 2, 3 or 4 and X is hydrogen or fluorine.

3,594,484

1 - CHLORO - 1,1,3,3,3 - PENTAFLUORO-2-PROPYL METHYL ETHER AS INHALATION ANESTHETIC

Everett E. Gilbert and Benjamin Veldhuis, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 10, 1967, Ser. No. 608,276
The portion of the term of the patent subsequent to Oct. 10, 1984, has been disclaimed
Int. Cl. A61k 27/00
U.S. Cl. 424—342 1 Claim

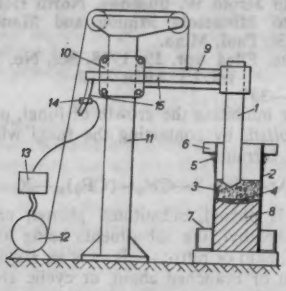
This application relates to the novel compound 1-chloro-1,1,3,3,3-pentafluoro-2-propyl methyl ether and its use as a potent general inhalation anesthetic having a high margin of toxic safety.

ELECTRICAL

3,594,485
INGOT PRODUCTION

Frank Tinker, Sheffield, England, assignor to Associated Electrical Industries Limited, London, England

Filed Apr. 5, 1968, Ser. No. 719,170
Claims priority, application Great Britain, Apr. 7, 1967, 16021/67
Int. Cl. H05b *3/60*
U.S. Cl. 13—13 11 Claims

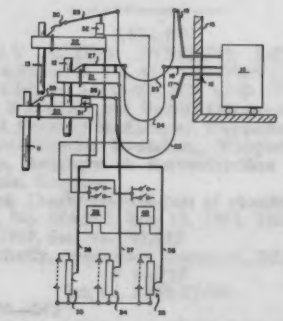


An electroslag plant for ingot production from a plurality of electrodes connectable to a common supply for contemporaneous melting is arranged for control of the progressive feeding of the electrodes during the process by a single controller responsive to electrode current. If separate mechanical arrangements are provided for supporting and progressing the electrodes individually the single controller can be arranged to be switched for controlling each of the electrodes in turn. Alternatively the several electrodes can be supported on a common feed carriage controlled by the single controller in dependence on an electrode current reference which may be either the current drawn by one electrode or the average or summation of the electrode currents.

3,594,486
PROCESS AND EQUIPMENT FOR OPERATING ELECTRIC ARC FURNACES

Manfred Jellinghaus, Rheinhausen, Germany, assignor to Heppenstall Company, Pittsburgh, Pa.

Filed Sept. 25, 1969, Ser. No. 861,059
Int. Cl. H05b *7/10*
U.S. Cl. 13—13 5 Claims

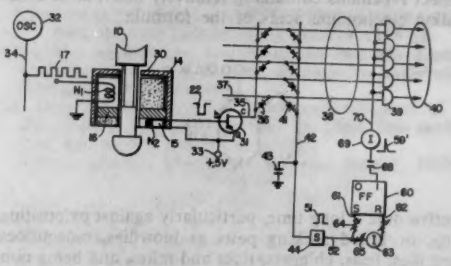


A process and apparatus are provided for operating three-phase electric arc furnaces by maintaining equal impedance in all of the three electrode circuits. This may be accomplished by adjusting the relative sag of the circuit wires.

3,594,487
CONTACTLESS ELECTRONIC KEYBOARD ARRAY

John Paul Jones, Jr., Wayne, Pa., assignor to Navcor, Inc.

Filed Aug. 25, 1969, Ser. No. 852,590
Int. Cl. G01h *3/00*
U.S. Cl. 84—1.1 5 Claims

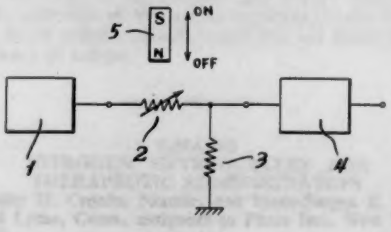


An electronic keyboard system includes a key structure comprising primary and secondary coils coupled together by a magnetic shaft when moved to produce primary signals from a pulse train in the secondary. A magnetic shield between the coils produces a sharp transistor between no-signal and signal condition in the secondary winding as the shaft is moved past a critical position. Electronic circuitry provides for converting the pulse train into a single output pulse for each key depression, by use of a single Schmidt trigger circuit coupled into an encoding matrix to produce a coded signal for each separate key.

3,594,488
ELECTRONIC MUSICAL SYSTEM WITH MAGNETIC FIELD RESPONSIVE SWITCH AND VOLUME CONTROL

Junji Ohno, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Mar. 12, 1969, Ser. No. 806,574
Claims priority, application Japan, Mar. 18, 1968, Mar. 22, 1968, 43/21336;43/22491
Int. Cl. G01h *1/02*
U.S. Cl. 84—1.27 7 Claims



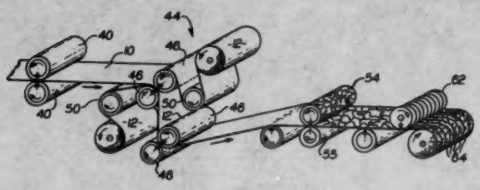
An electronic musical system has a tone generator and a tone coloring circuit with a first resistance connected in series between them. A second resistance has one end connected to the series circuit between the tone coloring circuit and the tone generator and the other end connected to ground. One of the resistances is a magnetoresistor, the electrical resistance of which varies in accordance with the intensity of the magnetic field applied thereto. A key is movably mounted above the magnetoresistor with a magnet element mounted thereon close to the magnetoresistor, so that movement of the key controls the electrical resistance of the magnetoresistor depending on the amount the key is moved.

3,594,489

EXTRA HIGH VOLTAGE CABLES

Carlos Katz, Bayonne; George S. Eager, Jr., Upper Montclair, and George Bahder, Edison, all of, N.J., assignors to General Cable Corporation, New York, N.Y.

Filed Oct. 7, 1968, Ser. No. 765,447
Int. Cl. H01b 7/02
U.S. Cl. 174—25 11 Claims



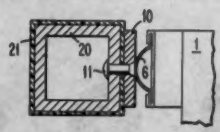
For extra high voltage power cables this invention provides insulation consisting of synthetic plastic material with paper bonded to both sides to form a laminated strip. In place of the porous paper previously used, this invention uses very thin paper such as "capacitor tissue"; space for the thermal expansion of the synthetic and passages for the removal of moisture and the introduction of oil are obtained by embossing the strip. To prevent locking of overlying strips when bending the cable, the embossing is preferably embossed with a random pattern, or plain unembossed strips are wrapped alternately between embossed strips. The invention includes the novel strip, cable made with the strip and the method of making the strip.

3,594,490

ELECTRONIC GROUNDING SYSTEM

Leonard A. Mitchell, Endwell, N.Y., and Arvindlal M. Shah, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 17, 1970, Ser. No. 55,871
Int. Cl. H05k 9/00
U.S. Cl. 174—35 MS 10 Claims



A grounding system for electronic unit. A metallic frame has a protective coating of nonmetallic conductive paint. Metal strips, having a substantial area in contact with the conductive paint, coact with the conductive paint to provide a low-impedance path to the frame.

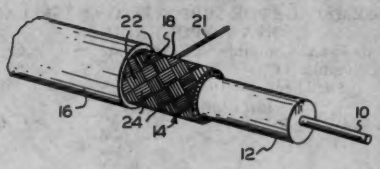
3,594,491

SHIELDED CABLE HAVING AUXILIARY SIGNAL CONDUCTORS FORMED INTEGRAL WITH SHIELD

Donald F. Zeidlhack, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed June 26, 1969, Ser. No. 836,693
Int. Cl. H01b 11/06
U.S. Cl. 174—36 11 Claims

A shielded flexible coaxial cable is described in which auxiliary outer signal conductors are formed integral with the shield surrounding the inner conductor. The shield is formed by a plurality of uninsulated shield wires wrapped about a dielectric core so that they are in electrical contact. The shield wires may be woven together to form a braided shield, or wound in a spiral to form a spiral-wrapped shield. The auxiliary outer conductors are in the form of insulated wires wrapped together with the shield wires simultaneously with the forming of the shield so that the resulting cable is not increased in diameter. A metal foil layer may also be provided beneath the wires to increase the shielding attenuation.

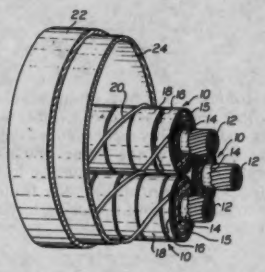


3,594,492

PIPE-TYPE CABLE SYSTEMS WITH REDUCED AC LOSSES

George Bahder, Edison, and Carlos Katz, Bayonne, both of, N.J., assignors to General Cable Corporation, New York, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,353
Int. Cl. H01b 9/02
U.S. Cl. 174—36 16 Claims



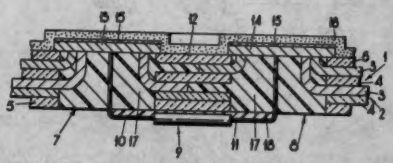
A magnetic, low-loss liner in a metal pipe reduces the AC loss of high-voltage electrical cable enclosed within the pipe; or the cable in the pipe can be wrapped with a sheet or tapes of the magnetic low-loss material. Tapes used for the purpose can be plastic with suitable metal, such as ferromagnetic material of high permeability distributed through the plastic.

3,594,493

PRINTED CIRCUIT ASSEMBLIES AND METHOD

Alan Michael Kauffman, Edgeware, and James Bond, Camberley, both of, England, assignors to Elliott Brothers Limited, London, England

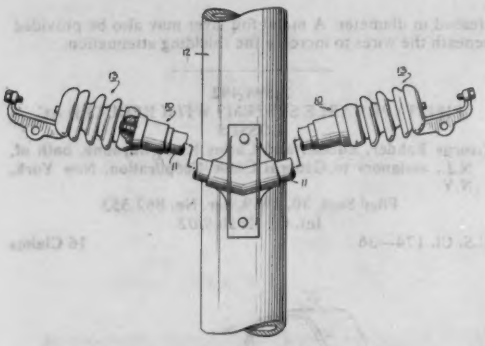
Filed Oct. 2, 1969, Ser. No. 866,075
Claims priority, application Great Britain, Oct. 2, 1968, 46,773/68
Int. Cl. H05k 1/18, 3/36
U.S. Cl. 174—68.5 3 Claims



A multilayer printed circuit assembly has connections between the layers formed by extending a printed circuit conductor from each layer through a number of aligned holes in the different layers to the outer surface of the assembly where the end faces of the conductors terminate in the same plane. A plated layer then interconnects the end faces. Com-

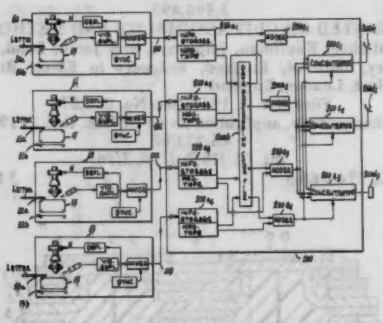
ponent leads may also extend through holes to the connection plane. The assembly is potted in stages.

3,594,494
AN ASSEMBLAGE FOR SUPPORTING AN INSULATOR ON A SUPPORT ROD
Ross J. Sullivan, Columbia, S.C., assignor to C/P Corporation, Columbia, S.C.
Filed Sept. 24, 1969, Ser. No. 860,537
Int. Cl. H01b 17/14
U.S. Cl. 174—158 R 21 Claims



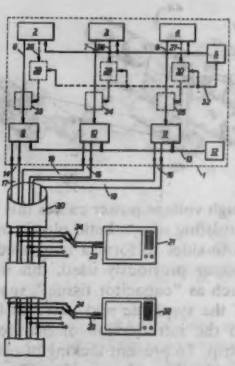
The support is constructed of a fitting which fits over the end of a glass fiber rod, a threaded member which extends out of the fitting to threadably receive an insulator and spring washers within the recess of the fitting which serve to urge the fitting against the insulator in a frictional locking relation. Upon threading the insulator against the fitting, the spring washers flatten so as to create the locking force between the insulator and fitting.

3,594,495
RADIO FACSIMILE POSTAL SYSTEM
Donald S. Bond, Princeton, N.J., assignor to RCA Corporation
Filed Jan. 30, 1968, Ser. No. 701,642
Int. Cl. H04n 7/16
U.S. Cl. 178—5 4 Claims



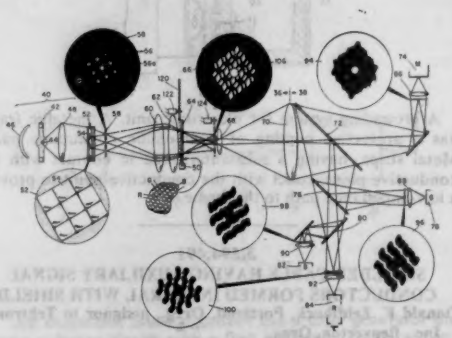
A radio facsimile postal system including means for transmitting image signals representative of a written message to be communicated together with code signals uniquely identifying the addressee, and means for receiving the transmitted image and code signals and for reproducing the message from the image signals upon a radio facsimile recorder conditioned to respond only to the code signals identifying the assigned addressee.

3,594,496
WIRED BROADCASTING SYSTEMS
Gabriel Ralph Parton, Cobham, nr. Woking, Surrey, England, assignor to Communications Patents Limited
Filed Mar. 10, 1969, Ser. No. 805,692
Claims priority, application Great Britain, Mar. 13, 1968, 12181/68
Int. Cl. H04n 9/02, 5/04
U.S. Cl. 178—5.2 R 14 Claims



A wired television transmission system is disclosed for conveying a plurality of programs over a communication channel while reducing interference patterns. Thus, several program sources are synchronized and modulated with common signals. This eliminates beat signal patterns. The signals are sent out in a common cable through twisted pairs, each having a different pitch to minimize cross-coupling.

3,594,497
COLOR TV FILM REPRODUCTION SYSTEM COMPATIBLE WITH DIFFRACTION PROCESS COLOR PROJECTION SYSTEMS
Michael Graser, Jr., Bedford, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.
Filed Jan. 28, 1969, Ser. No. 794,709
Int. Cl. G02b 27/38; H04n 9/08
U.S. Cl. 178—5.4 11 Claims



This disclosure depicts improved color television film reproduction systems and methods for displaying either conventional color transparency cine film, or cine records on which color separation information is stored as signals modulating separately detectable spatial carriers. The illustrated system comprises, inter alia, novel light source means for producing a plurality of highly spatially coherent light sources and a source of less coherence, and means employing the source of less coherence for establishing a wideband luminance channel through the system. The disclosed system

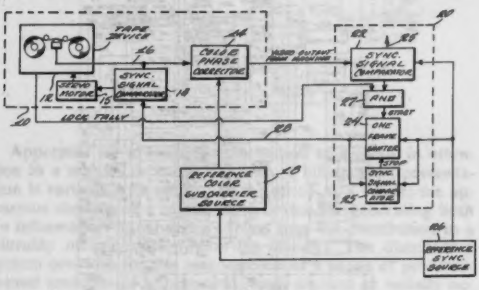
further includes novel spatial filtering means and methods for enabling detection of red, blue, green, and luminance information without the need for spectral filtering in either the projector or camera stages.

3,594,498

COLOR-PHASE-CORRECTING CIRCUITRY WITH ONE-HUNDRED EIGHTY DEGREE AMBIGUITY ELIMINATION

Peter W. Smith, Beaconsfield, Quebec, Canada, assignor to Central Dynamics, Ltd., Pointe Claire, Montreal, Quebec, Canada

Filed Oct. 9, 1969, Ser. No. 865,155
Int. Cl. H04n *5/24, 5/78, 9/46*
U.S. Cl. 178—5.4 CD **5 Claims**



Color-phase-correcting circuitry for use with a color video tape machine is disclosed. Such machines typically include (1) a tape drive, (2) means for controlling the speed of the tape which are responsive to the vertical synchronizing pulses derived from a video reference signal (3) a read/write head for reading a signal from the tape to thereby derive a composite color signal, (4) means for adjusting the phase of the composite signal so that the horizontal and vertical synchronizing pulses of the composite signal are in phase with the horizontal and vertical pulses of the video reference signal, and (5) means for adjusting the phase of the composite signal so that the color subcarrier of the composite signal will be in phase with the color subcarrier of the reference signal. This adjustment is made following the adjustment described in (4) and under some circumstances can cause the phase adjustment described in (4) to be destroyed. The improvement includes a sync signal comparator which compares the phase of the horizontal synchronizing pulses of the composite color signal with the phase of the horizontal synchronizing pulses of the video reference signal after the correction described in (5) has taken place. If any phase deviation exists, an appropriate signal is applied to circuitry which controls the tape speed to shift the video signal one picture frame. Phase synchronism is then obtained with respect to both the vertical and horizontal synchronizing pulses and with respect to the color subcarrier signals.

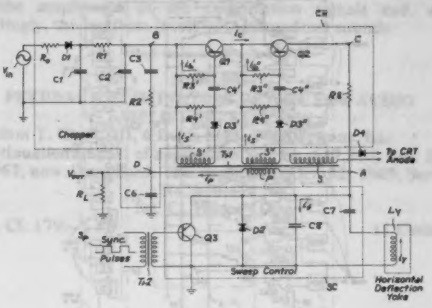
3,594,499

VOLTAGE-STEPDOWN CIRCUIT ARRANGEMENT FOR TELEVISION POWER SUPPLY

Vincenzo Sansone, and Franco Gatti, both of Pavia, Italy, assignors to Ates Componenti Electronici S.P.A., Milan, Italy

Filed Feb. 27, 1969, Ser. No. 802,868
Claims priority, application Italy, Mar. 8, 1968, 13,734
Int. Cl. H04n *5/00*
U.S. Cl. 178—7.3 R **9 Claims**

In order to provide a reduced output voltage for feeding a transistorized load, a rectified supply voltage from an AC utility outlet is chopped under the control of a recurrent pulse in the load circuit, specifically the flyback pulse of the horizontal sweep circuit of a television receiver, with the aid of a normally blocked transistor connected to be unblocked by an intermittent biasing current from a secondary winding of a transformer whose primary winding acts as an inductance of a smoothing network for the chopped supply voltage.

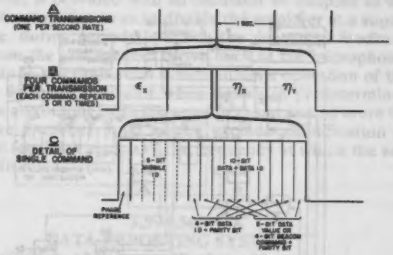


3,594,500

MISSILE COMMUNICATIONS LINK

James L. James, Woodbine, and Hiliary H. Nall, Beltsville, both of, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 11, 1961, Ser. No. 144,511
Int. Cl. H04l *9/00*
U.S. Cl. 178—22 **11 Claims**


COMMAND TRANSMISSIONS (ONE PER SECOND RATE)
FOUR COMMANDS PER TRANSMISSION (EACH COMMAND REPEATED 5 OR 10 TIMES)
DETAIL OF SINGLE COMMAND
PHASE REFERENCE

The system provides for the simultaneous control of a plurality of missiles and comprises a missile receiver system for handling a large quantity of data. The receiver performs a parity check for handling an error detecting code, is able to handle phase-coded digital transmission, and contains means for distinguishing between different data signals.

3,594,501

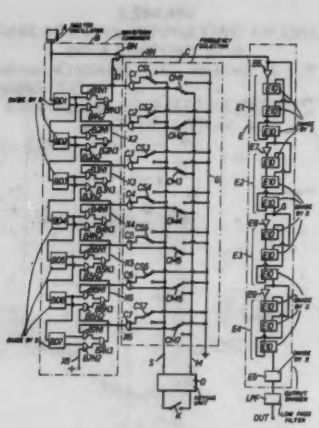
SELECTIVE MULTIPLE PAIR FREQUENCY SHIFT TELEGRAPH ENCODER

Boleslaw Marian Sosin, Essex, England, and Alec J. Prime, New South Wales, Australia, assignors to The Marconi Company Limited, London, England

Filed July 18, 1968, Ser. No. 745,856
Claims priority, application Great Britain, July 19, 1967, 33,136/67
Int. Cl. H04l *27/00*
U.S. Cl. 178—66 **9 Claims**

In a frequency shift telegraph system any pair of a number of pairs of frequency values is derived from a single-master oscillation source. Oscillations from the source are divided and combined in pairs so as to produce, on selection, equal

multiples of the required "mark" and "space" frequencies. A keying arrangement determines when the "mark" and "space" frequencies are produced, and a frequency divider converts the frequencies to the desired values.

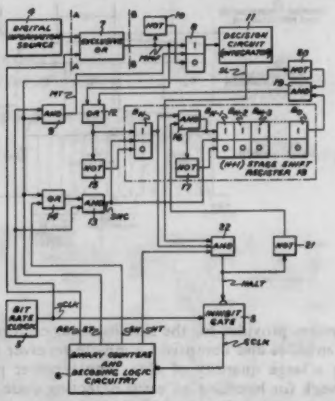


3,594,502

A RAPID FRAME SYNCHRONIZATION SYSTEM

James M. Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 4, 1968, Ser. No. 780,981
Int. Cl. H04n *1/36*
U.S. Cl. 178—69.5 R **10 Claims**



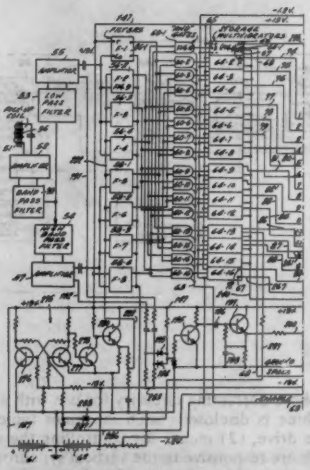
A binary information signal having a given bit rate and a local binary synchronization reference signal are applied to a digital comparison circuit, the output signal thereof indicating a match or mismatch between the binary condition of successive adjacent bits of the information signal and the reference signal. A flip flop samples the output signal of the comparison circuit. A decision circuit responds to the samples from this flip flop to produce binary "0" when the decision level is exceeded and binary "1" when the decision level is not exceeded. This output signal is also coupled through an OR gate to an (N+1) bit shift register which is triggered by a burst of pulses at the bit rate. The previous inputs to the shift register are stored therein and the output thereof is also coupled through the OR gate. An AND-gate is coupled to the output of the first flip-flop of the shift register and the decision circuit and produces an output signal only when this flip flop indicates a mismatch and the decision circuit produces binary "1" during halt time. This output signal is coupled to an INHIBIT-gate disposed between a bit rate clock and binary counters to change the counting of the counters to achieve synchronization in less time than required by prior art frame synchronization systems.

3,594,503

DECODING CIRCUIT FOR TELEPHONE TRANSACTION SYSTEM

Arnold M. Wolf, Brooklyn, and John G. Richter, Yonkers, both of, N.Y., assignors to Electrospace Corporation, Glen Cove, N.Y.

Filed Mar. 12, 1969, Ser. No. 806,439
Int. Cl. H04l *27/30*
U.S. Cl. 178—88 **10 Claims**



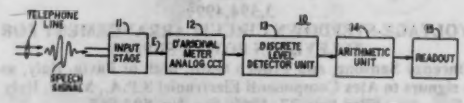
A system is described for buying materials or services by transferring funds in a bank from the buyer's deposit account to the seller's account. The transfer of funds is accomplished by means of a "touch-tone" telephone receiving set equipped with a printing means. A computer at the bank receives digital orders from the receiving set, decodes the orders and records the transfer at that location. Each purchaser is provided with a secret purchaser number on a telephone operating card and the entire operation is performed in the presence of the purchaser and a representative of the seller or store.

3,594,504

DIGITAL ACOUSTIC VOLUME INDICATOR

Verne E. Munson, Brielle, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

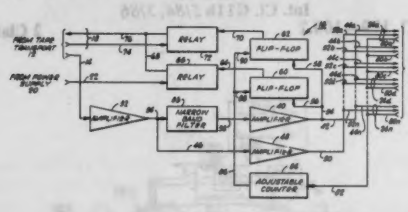
Filed May 13, 1969, Ser. No. 824,142
Int. Cl. H04r *29/00*
U.S. Cl. 179—1 N **9 Claims**



This disclosure describes a digital volume indicator that replaces a conventional VU meter for speech level measurement. The indicator operates on speech-produced peak voltages. A voltage function analogous to the dynamic meter movement characteristic of the conventional VU meters is quantized in a series of threshold detectors. Suitable gating provides for a detector output only for the highest threshold exceeded for a given analog voltage excursion. Over a

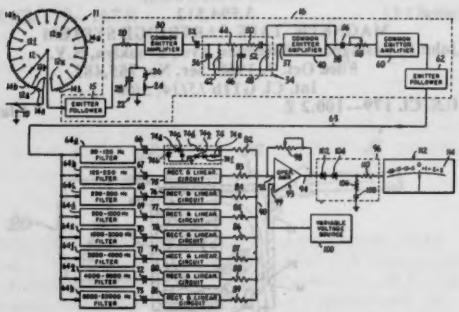
specified time, the detector outputs representing the quantized peaks are characterized as by averaging in an arithmetic section to produce a representative VU reading for the speech analyzed.

3,594,505
INFORMATION DISTRIBUTION SYSTEM
David D. Price, Jr., 3429 Partridge, Oklahoma City, Okla., and Ford C. Price, 1909 NW 56 Terrace, Oklahoma City, Okla.
Filed Sept. 18, 1967, Ser. No. 668,627
Int. Cl. G09b 19/06
U.S. Cl. 179—1 B 2 Claims



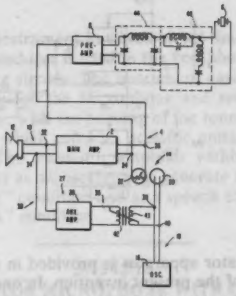
Apparatus for presenting information to a group in attention in a manner whereby the rate of information presentation is variable with respect to the group as a whole; the apparatus consists of a reproducing device for generating both an information signal and a control tone for distribution to a plurality of information-receiving stations. The distribution system provides for the reproduction of a series of predetermined amounts of information, each amount or serially occurring portion being terminated by a control tone which ceases reproduction and enables a listener response tally. Thereafter, each listener signifies readiness to continue by means of a switch closure, and after a predetermined number of such switch closures the reproducing device is restarted to generate the next segment of its information.

3,594,506
LOUDNESS LEVEL INDICATOR
Benjamin B. Bauer, Stamford, Conn.; Emil L. Torick, Darien, Conn.; Richard G. Allen, Pound Ridge, N.Y., and Allen J. Rosenheck, Stamford, Conn., assignors to Columbia Broadcasting Systems, Inc., New York, N.Y.
Filed Apr. 1, 1968, Ser. No. 717,695
Int. Cl. G01h 5/00
U.S. Cl. 179—1 P 1 Claim



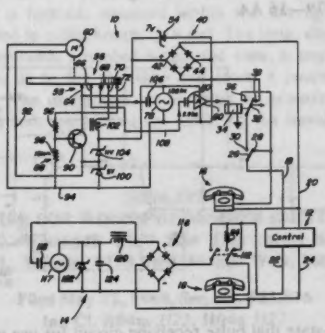
As described herein, a loudness level indicator for measuring the loudness levels of broadcast (and other) sounds includes an equalizing network having a transfer characteristic which is the inverse of an equal loudness contour representative of the loudness levels of broadcasting sounds over a selected range of pressure levels. Signals corresponding to the broadcast sounds are equalized by the equalizing network such that sounds of any particular frequency having equal loudnesses are provided as voltage signals having equal amplitudes. These equalized signals are separated by a plurality of filters and the separated signals are then combined linearly by a combining network. A ballistics shaping network shapes the combination signals and supplies the combination signals to an indicating instrument which provides a visual indication of the amplitudes of the combination signals and, accordingly, the loudness levels of the broadcast sounds.

3,594,507
FEEDBACK ELIMINATING DEVICE FOR AUDIO AMPLIFYING SYSTEMS
William T. Clark, III, 6 Davis Blvd., New Orleans, La.
Continuation-in-part of application Ser. No. 617,324, Feb. 20, 1967, now abandoned. This application Oct. 22, 1969, Ser. No. 870,414
Int. Cl. H04m 1/20
U.S. Cl. 179—1 FS 11 Claims



An audio amplifying system, including a loud speaker from which an acoustical signal would normally be fed back to a microphone, is provided with an oscillator so coupled to the input of the amplifier so as to disable the amplifier at a supersonic rate, during periods in which the acoustical feedback signals from the loudspeaker arrive back at the microphone. An amplitude discrimination system inhibits operation of the amplifier disabling oscillator when signals of predetermined amplitude are output from the amplifier, and one or more filters in the amplifier input circuit exclude amplification of acoustical feedback signals of the frequency at which the amplifier is disabled.

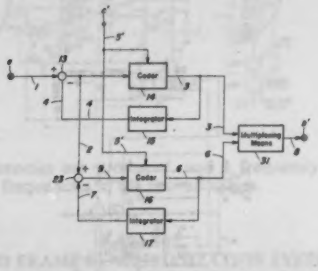
3,594,508
DATA REPORTING SYSTEM
Roger C. Glidden, 12 Pleasant, Wenham, Mass.
Filed Aug. 21, 1969, Ser. No. 851,878
Int. Cl. H04m 11/04
U.S. Cl. 179—5 R 16 Claims



A motor-driven code wheel programs the supply of electrical energy from telephone lines to the code wheel-driving

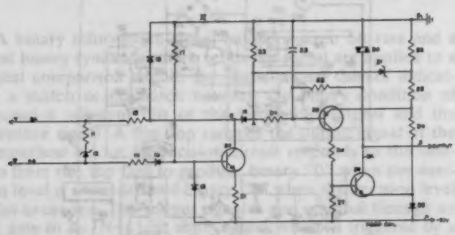
motor through a switching device to intermittently load the telephone lines during a dialing period producing dialing pulses through the code wheel. The lines are continuously loaded by the motor, an oscillator and a frequency-tuned amplifier during a message period when the output of the oscillator is gated onto the lines through the code wheel. Recycling is stopped when a return signal tone in the lines is recognized by the frequency-tuned amplifier.

3,594,509
DELTA MODULATOR APPARATUS
Tadao Shimamura, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan
Filed Aug. 5, 1969, Ser. No. 847,622
Claims priority, application Japan, Aug. 6, 1968, 43/55290
Int. Cl. H04j 3/18
U.S. Cl. 179—15 AV **10 Claims**



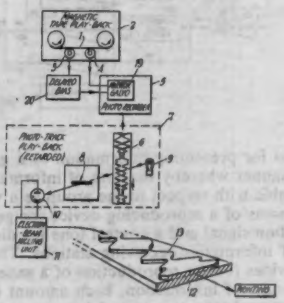
Delta modulator apparatus is provided in accordance with the teachings of the present invention. In one exemplary embodiment of the present invention high-speed delta modulator apparatus is provided wherein a plurality of relatively low speed delta modulator means are arranged so that one of such plurality of low speed delta modulator means adapted to receive an input signal to be modulated while each succeeding one of said plurality of low speed delta modulator means is connected to a preceding one of such plurality of low speed delta modulator means in a manner to receive an error signal therefrom as an input thereto. The plurality of relatively low speed delta modulator means each includes commonly timed coder means whose outputs may be combined in a multiplex manner whereby the resulting modulator apparatus exhibits an equivalent sampling rate equal to the sampling rate of each of said plurality of relatively low speed delta modulator means multiplied by the number of relatively low speed delta modulator means present in said plurality.

3,594,510
DIAL PULSE RECEIVER CIRCUIT
William H. Blashfield, Galion, Ohio, assignor to North Electric Company, Galion, Ohio
Filed Feb. 11, 1969, Ser. No. 798,296
Int. Cl. H04g 3/04
U.S. Cl. 179—16 AA **7 Claims**



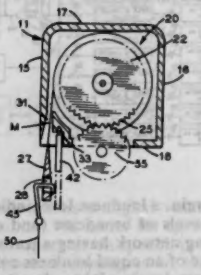
A solid-state dial pulse receiving circuit for use with an incoming pulsing loop in a telephone system comprising a solid-state circuit which provides sensitive response to direct current pulses, talking balance, common mode rejection of alternating current signals spuriously induced from adjacent powerlines and protection against false operation from transients. The circuit comprises an input transistor, associated circuitry and an output circuit which may operate a dial pulse receiving relay.

3,594,511
METHOD OF MANUFACTURING A STRIP-FORM PRINTING PLATE FOR TAPE-FORM RECORDINGS
David Alexander Pollock, "Woodhurst," Westhall Road, Warlingham, Surrey, England
Filed Sept. 23, 1968, Ser. No. 761,626
Claims priority, application Great Britain, Sept. 26, 1967, 43821/67
Int. Cl. G11b 5/84, 5/86
U.S. Cl. 179—100.2 **2 Claims**



A strip-form printing plate, for printing along a base tape a variable-width recording of information, for example of music, is manufactured by making at a first speed an intermediate recording of the information, for example a disc or photorecording, and reading the intermediate recording at a lower speed to produce signals which are used to control a continuous forming method of producing the required strip-form printing plate at a linear speed that is lower than the linear speeds of making and reading the intermediate recording. If on disc the intermediate recording may be read by means of a novel pickup head described herein. The printing plate may be used to print the variable width recording in magnetic or nonmagnetic ink. If in nonmagnetic ink the printed recording may be read by causing it to modulate the output of a high frequency oscillator in a novel manner described herein.

3,594,512
MAGNETIC TAPE CARTRIDGE SYSTEM
John F. Castagna, 835 Remsen Ave., Brooklyn, N.Y.
Filed Oct. 7, 1968, Ser. No. 765,482
Int. Cl. G11b 15/34, 5/00
U.S. Cl. 179—100.2 Z **7 Claims**



A combination magnetic tape cartridge and playback device where the cartridge carries a tape on which is recorded musical material or the like as a very large number

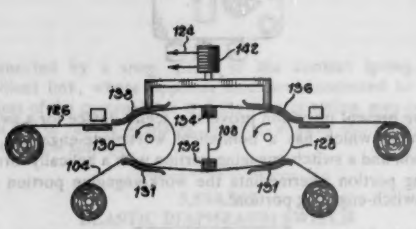
of individual selections and arranged for convenience of selection; the playback device being adapted to accommodate cartridges of varying size.

3,594,513

APPARATUS FOR ELIMINATING SILENT INTERVALS BETWEEN SIGNALS

Sanford David Greenberg, Buffalo, and Bert B. Norvell, Tuckahoe, both of, N.Y., assignors to Cambridge Research and Development Group, Westport, Conn.

Division of Ser. No. Mar. 8, 1966, Pat. No. 3,480,737
Filed Apr. 25, 1969, Ser. No. 856,507
Int. Cl. G11b *5/86, 27/08*
U.S. Cl. 179—100.2 E 5 Claims



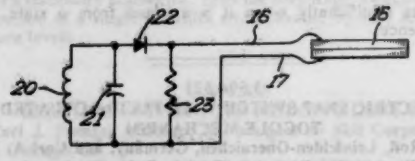
Apparatus for transferring signals from a first magnetic tape to a second magnetic tape in different relative positions including a common capstan drive for both tapes with means controlled by the signals on the first tape for engaging the second tape with the capstan, a pickup head and a recording head associated respectively with the first tape and the second tape and means including a signal delay network coupling the two heads.

3,594,514

HEARING AID WITH PIEZOELECTRIC CERAMIC ELEMENT

Robert C. Wingrove, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of application Ser. No. 625,042, Mar. 22, 1967, now abandoned. This application Jan. 2, 1970, Ser. No. 489
Int. Cl. H04r *25/00*
U.S. Cl. 179—107 R 13 Claims



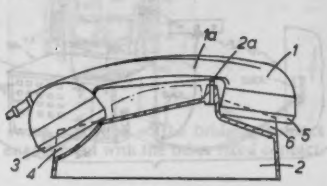
Implantable hearing aid apparatus having a piezoelectric ceramic element mounted adjacent to the auditory conductive system of the middle ear for imparting vibration thereto. The piezoelectric element being electrically connected to electrical circuitry for providing electrical signals representative of sound waves. The electrical circuitry and the piezoelectric element being properly encapsulated for implantation within the body.

3,594,515

SOUND REFLECTING TELEPHONE CASING

Ronald Ernest Charles Brown, Orpington, England, assignor to Associated Electrical Industries Limited, London, England

Filed July 12, 1968, Ser. No. 744,430
Claims priority, application Great Britain, July 12, 1967, 32021/67
Int. Cl. H04m *1/02*
U.S. Cl. 179—100 3 Claims



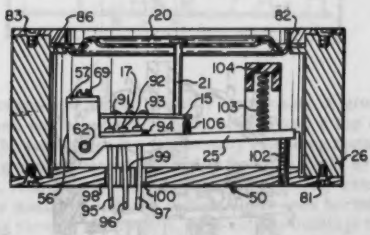
A telephone instrument in which either the microphone or the receiver transducer is used in the "on-hook" condition to emit tone calling signals. The instrument casing is shaped to provide recesses for the microphone and receiver housings such as to define, with the housing of the tone-emitting transducer, a cavity which provides acoustic enhancement of the emitted tone. The transistor amplifier within the casing is connected to act as an oscillator to generate the calling tone in the "on-hook" condition and as a speech current amplifier in the "off-hook" condition.

3,594,516

SEMICONDUCTOR MICROPHONE WITH CANTILEVER-MOUNTED SEMICONDUCTOR

Frederick G. Storz, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 18, 1968, Ser. No. 784,804
Int. Cl. H04r *23/00*
U.S. Cl. 179—121 R 8 Claims



A semiconductor microphone includes a strip, on which a transistor is formed, mounted within the microphone case and coupled to a diaphragm by a rod. The strip, clamped to a member movably mounted within the case, is urged against the rod so as to flex the strip and stress a junction of the transistor. The diaphragm, in response to acoustical forces, moves the rod, modulating the stress on the transistor junction.

3,594,517

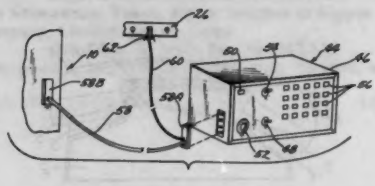
VERIFIER FOR WIRING OF NUMBER IDENTIFIERS

Charles L. Woodruff, 1109 East 15th Street South, and Ruben L. Wienke, 1290 First Avenue West, both of Newton, Iowa

Filed May 12, 1969, Ser. No. 823,816
Int. Cl. H04m *3/22*; H04q *3/72*
U.S. Cl. 179—175.25 13 Claims

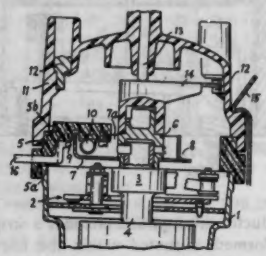
A device for verifying the core panel wiring of identifier equipment for direct-dial long distance telephone equipment

comprising plurality of lamps connected through two groups of relays to the output of the core panel of the identifier equipment, wherein the first of said two groups of relays are operatively connected to one of the sequencing relays of the identifier equipment which selectively provide input voltage to the core panel, and the second group of relays being connected to a source of energy independent of the sequencing



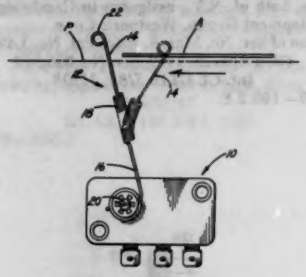
relays to hold in an illuminated condition any lamps lighted in response to output from the first sequential output from the core panel. An additional lamp operatively connected to the identifier equipment to indicate that the equipment is in use, a party selection switch connected to the party identification relays of the identifier equipment, and a starting switch to connect the verifying device to the circuitry of the identifier equipment.

3,594,518
ELECTRIC SWITCHES
Gordon Frederick Bates, Coventry, England, assignor to Brico Engineering Limited, Coventry, England
Filed Dec. 1, 1969, Ser. No. 881,078
Claims priority, application Great Britain, Dec. 13, 1968, 59548/68
Int. Cl. H01h *19/00*
U.S. Cl. 200—19 M **6 Claims**



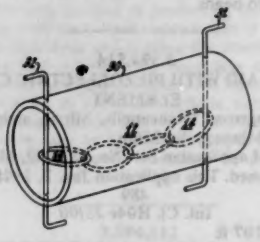
This invention relates to electric switches which are suitable for use as a trigger switch in a fuel injection system for a spark ignition internal combustion engine, in order to determine the instant of opening of one or more electrically actuated fuel injection valves. The invention provides the combination of an ignition distributor and contact breaker assembly with an electric switch having a movable member for effecting operation of the switch, the arrangement being such that rotation of a part of the ignition distributor causes movement of the movable member of the switch to effect its operation. Embodiments are described wherein the electric switch comprises one or more magnetically operable reed contact switches in combination with one or more magnet members for actuating the reed contact switch or switches.

3,594,519
SWITCH ASSEMBLY FEELER
Raymond J. Schmidlin, Lyndhurst, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Jan. 9, 1970, Ser. No. 1,577
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.41 **1 Claim**



The present invention provides a feeler device for a switch assembly which has a nonhelical workpiece-engaging end portion and a switch-engaging portion with a helically formed spring portion intermediate the work-engaging portion and the switch-engaging portion.

3,594,520
AGITATION SWITCH
James R. Hall, Canoga Park, and Peter B. Korda, Los Angeles, both of, Calif., assignors to RCA Corporation
Division of Ser. No. 682,121, Nov. 13, 1967.
Filed Oct. 22, 1969, Ser. No. 870,840
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.45 **8 Claims**

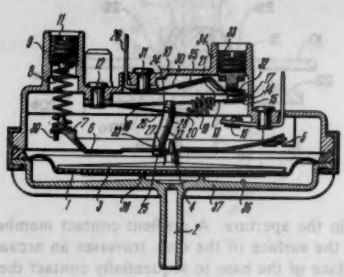


Disclosed is a switch element, primarily for use within a detection system. The switch is formed of electrically conductive links intercoupled in a loose chain and exhibits a through impedance, as measured across its terminals, which changes significantly when it is agitated from a state of quiescence.

3,594,521
ELECTRIC SNAP SWITCH WITH FLUID-ACTUATED TOGGLE MECHANISM
Karl Roll, Leinfelden-Oberaichen, Germany, and Carl A. H. M. Waskowsky, Oberglatt, Zurich, Switzerland, assignors to Patinvest Patent- und Investment A. G., Chur, Switzerland
Filed June 6, 1969, Ser. No. 830,973
Claims priority, application Switzerland, June 18, 1968, Nov. 20, 1968, 9395/68, P 18 09 964.4
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 R **13 Claims**

A pressure-controlled snap switch in which the free end of a contact spring projecting between two spaced switch contacts is pivotable with a toggle motion from one contact

against the other when a diaphragm in the switch housing is moved by the pressure of a liquid or gas. The movement of the diaphragm is transmitted to an adjustable control lever and the resulting swing of this lever is transmitted by a resilient link to a pivotable control spring whose free end is



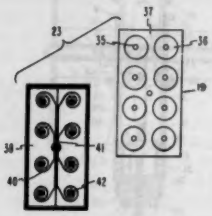
connected by a snap spring to the contact spring. The resilient link, whose opposite ends are connected to fixed points of the control lever and the control spring, may consist of a rod of rubber or plastic, or of an angular leaf spring or a torsion coil spring.

3,594,522

ELASTIC DIAPHRAGM SWITCH

Donald F. Colglazier, and Myron E. Snesrud, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 24, 1969, Ser. No. 844,349
Int. Cl. H01l *35/34*
U.S. Cl. 200—83 B **9 Claims**



An elastic diaphragm switch has a diaphragm assembly formed as an airtight interface between a substantially rigid substrate material and a diaphragm of highly flexible film to which is adhered a copper conductive pattern designed to withstand large deflections without fatigue. This is accomplished by an extended length conductor such as a spiral conductor path extending from the diaphragm supported contact to a stationary conductor. Thus the diaphragm switch may be formed of a single thin film and activated by very low-pressure levels.

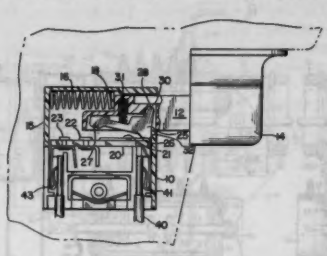
3,594,523

ELECTRIC SWITCH WITH BRIDGING CONTACT

Carl J. Frenzel, Chicago, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed May 8, 1969, Ser. No. 822,909
Int. Cl. H01h *13/64*
U.S. Cl. 200—157 **8 Claims**

An actuator in the form of a trigger moves a bridging contact back and forth between bridging and nonbridging positions with respect to a pair of fixed contacts mounted in spaced relation on a dielectric base. A fixed abutment surface is provided adjacent one of the fixed contacts. The bridging contact includes an abutment surface arranged to engage the fixed abutment surface for defining a fulcrum about which the bridging contact is rocked. The actuator and the bridging contact include respective interengaged formations for rocking the bridging contact about such fulcrum



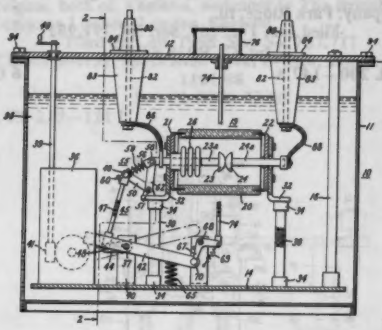
thereby to swing a portion of the bridging contact into and away from engagement with the other fixed contact.

3,594,524

VACUUM-TYPE ELECTRIC CIRCUIT BREAKER

Milton Louis Heintz, Newtown Square, Pa., assignor to General Electric Company

Filed Feb. 9, 1970, Ser. No. 9,618
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 **5 Claims**



A vacuum-type circuit breaker comprising a grounded metal tank having a tubular body portion and a top cover. Within the tank, there is a horizontally extending metal base plate at ground potential suspended from the cover by vertical rods. Attached to the baseplate are upwardly extending post-type insulators carrying at their upper ends horizontally extending vacuum interrupters. High-voltage bushings extend through the cover and are electrically connected to the interrupters by flexible conductors that prevent mechanical forces from being transmitted between the interrupters and the bushings. A closing device is mounted on the baseplate at the movable contact end of the interrupters and is connected to the interrupters by an insulating linkage for transmitting closing force thereto.

3,594,525

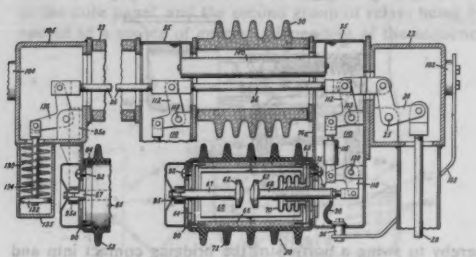
COMMON PARALLEL OPERATING MEANS FOR SERIES-CONNECTED, LATERALLY OFFSET VACUUM SWITCHES

Richard H. Miller, Berwyn, and Bruno C. Rudolph, Broomall, both of, Pa., assignors to General Electric Company

Filed Apr. 21, 1969, Ser. No. 817,849
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **10 Claims**

Discloses a high voltage vacuum-type circuit breaker which comprises a plurality of vacuum interrupters electrically connected in series. The interrupters are mounted on a skeletonlike structure that comprises a plurality of aligned tu-

bular insulators respectively associated with the interrupters in laterally spaced, generally longitudinally aligned relationship with respect to the associated interrupter. Adjacent ones of the interrupters in the series circuit are disposed in



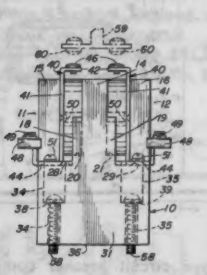
laterally offset relation relative to each other. An operating rod extends through the aligned insulators, and a plurality of linkages respectively couple the operating rod to the interrupters.

3,594,526

ELECTRICAL CONTACT ASSEMBLY WITH PERMANENT MAGNET BLOWOUTS

David L. Swindler, Northfield, Ohio, assignor to Square D Company, Park Ridge, Ill.

Filed Jan. 17, 1969, Ser. No. 791,951
Int. Cl. H01h *33/18*
U.S. Cl. 200—147 A **6 Claims**



A pair of disc-shaped permanent magnets are held in complementary recesses on opposite sides of an insulating contact block by respective contact arms which carry stationary contacts. Direct current arcs formed when a bridging contact separates from the stationary contacts are driven by the magnets in opposite directions with roots of the arcs moving along respective conductive rims surrounding the magnets.

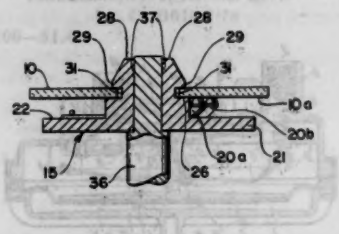
3,594,527

ROTOR ASSEMBLY FOR ELECTRICAL SWITCH

Roy G. Brant, Huntington Beach, and Lloyd E. Hall, Fullerton, both of, Calif., assignors to Beckman Instruments, Inc.

Filed Jan. 30, 1970, Ser. No. 7,116
Int. Cl. H01h *9/00*
U.S. Cl. 200—166 BH **13 Claims**

In a rotary switch having a plurality of switch contact pads disposed in an arcuate array around an aperture formed through a base member, a rotor and switch contact assembly mounted for rotation in the aperture. The assembly includes a nonconductive disc having a flat surface thereon and a hub section extending outwardly substantially normal to the surface of the disc. The hub is divided into at least two separate hub sections which extend through the aperture. The protruding ends of the hub sections are barb shaped thereby preventing withdrawal of the hub and rotor disc from the aperture of the base. A shaft is positioned within an opening in the disc and between the hub sections thereby locking the



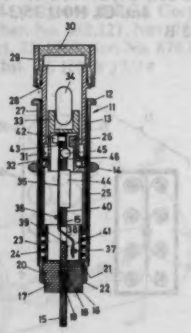
rotor within the aperture. A resilient contact member, supported on the surface of the disc, traverses an arcuate path on the surface of the base to sequentially contact the switch pads on rotation of the rotor assembly.

3,594,528

MINIATURE SWITCH HAVING INDICATING MEANS

Jean C. Viau, Basel, Switzerland, assignor to Sibalco W. Siegrist & Co., Basel, Switzerland

Filed June 16, 1969, Ser. No. 833,347
Claims priority, application Switzerland, June 29, 1968, 9741/68
Int. Cl. H01h *9/18*
U.S. Cl. 200—167 A **12 Claims**



The movement of a pushbutton or of a knob causes a ball to be pressed against a tensed flat, ferromagnetic spring attracted to a permanent magnet, forcing the spring, which carries the movable break and make contacts, away from the magnet and to snap close the make contacts, the stationary one of which is mounted on a plate with conductive paths. When the ball is released, the magnet attracts the spring and snaps the switch back to its rest position.

3,594,529

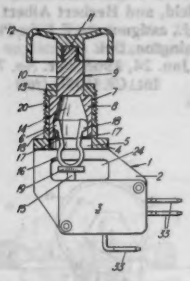
ACTUATING ASSEMBLIES AND COMPONENTS THEREFOR PARTICULARLY SUITABLE FOR ELECTRICAL SWITCHES

John Anthony Cartwright, Northampton, England, assignor to Painton & Company Limited, Kingsthorpe, Northampton, England

Filed July 24, 1969, Ser. No. 844,594
Claims priority, application Great Britain, Aug. 6, 1968, 37487/68
Int. Cl. H01h *3/12*
U.S. Cl. 200—172 A **9 Claims**

A switch assembly comprises an actuating member and a biasing assembly movable along a common longitudinal axis. Initial movement of the actuating member causes deforma-

tion of the biasing assembly thereby to energize the same. A position is reached where the biasing assembly moves towards a less stressed condition, such movement being adapted to actuate the device provided with the actuating assembly.

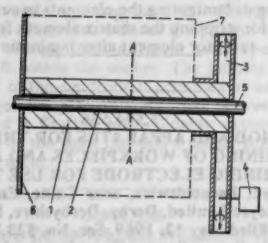


3,594,530

METHOD OF AND APPARATUS FOR HEATING OF DIELECTRIC MATERIALS IN A MICROWAVE FIELD

Fritz Wiegmann, Dresden, and Hans Wagner, Sebnitz, both of, Germany, assignors to Sachsische Glasfaser-Industrie Wagner & Co. K.G., Sebnitz, Germany

Filed Sept. 10, 1969, Ser. No. 856,789
Int. Cl. H05b 9/06, 5/00
U.S. Cl. 219—10.55 5 Claims



A method of and apparatus for heating, particularly dielectric materials by exposing them to the electromagnetic energy of a microwave field in a waveguide which is energized by a microwave generator and short-circuited at one end, which comprises the steps of heating dielectric material in a waveguide made of a solid dielectric nonmetallic material and containing a channel extending through its entire length. The channel is used for shaping and calibrating the dielectric material during the process of heating, continuously conveying axially through the waveguide in the direction of energy flux the dielectric material to be heated, and shielding the waveguide against radiant heat loss.

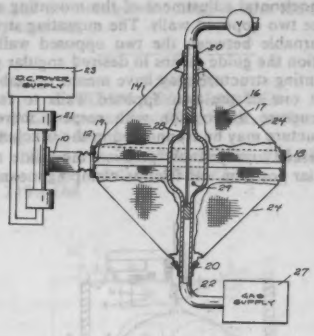
3,594,531

INTERNALLY VIEWABLE MICROWAVE INDUCTION HEATER

Ralph L. Hough, 708 Rice St., Springfield, Ohio

Filed Nov. 10, 1969, Ser. No. 875,195
Int. Cl. H05b 9/06, 5/00
U.S. Cl. 219—10.55 6 Claims

The present invention relates to an internally viewable microwave induction heater comprised of conductive screen, the width and height of whose meshes are small compared to the wavelength of selected microwaves within said internally viewable microwave induction heater. The selected microwaves do not pass through said meshes but remain contained within the interior of said internally viewable microwave induction heater. A microwave susceptible material within said internally viewable microwave induction heater can be visually observed while it is being inductively heated.

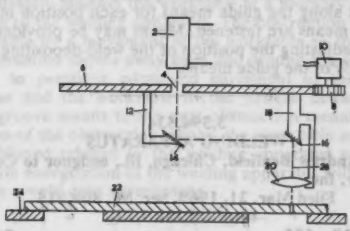


3,594,532

HEATING APPARATUS

Frank W. Lunau, Kingston, and Keith B. Weatherald, Reigate, both of, England, assignors to The British Oxygen Company Limited, London, England

Filed Dec. 30, 1968, Ser. No. 787,711
Claims priority, application Great Britain, Jan. 8, 1968, 1101/68
Int. Cl. B23k 27/00
U.S. Cl. 219—121 L 3 Claims



Apparatus for heating a workpiece by a radiant energy beam utilizing two mirrors to direct the beam. The first mirror which intercepts the beam from its source is rotatably mounted on a fixed support, and the second mirror is rotatably mounted and is controlled by an electrical system. The second mirror intercepts the beam from the first mirror and transmits the beam to the workpiece.

3,594,533

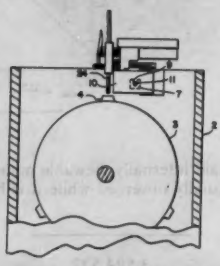
WELDING APPARATUS

Hubert J. Anderson, Pewaukee, Wis., assignor to The McKay Company, Pittsburgh, Pa.

Filed July 12, 1968, Ser. No. 744,473
Int. Cl. B23k 9/04
U.S. Cl. 219—76 13 Claims

Welding apparatus comprising a mounting structure, means for mounting the mounting structure upon two opposed walls so that the mounting structure spans the space between the walls, guide means carried by the mounting structure, the guide means extending generally parallel to the mounting structure and almost spanning the space between the walls, means for adjustably automatically the guide means and fastening the same transversely desired angular positions between the two opposed walls and weld depositing means movable along the guide means to deposit a bead of weld metal on a surface between the two opposed walls. The

means for mounting the mounting structure upon the two opposed walls may include brackets appliable, as, for example, by welding, to the walls. The brackets may be designed to provide for horizontal adjustment of the mounting structure parallel to the two opposed walls. The mounting structure is preferably turnable between the two opposed walls to adjustably position the guide means in desired angular positions and the mounting structure may have means operable to engage at least one of the two opposed walls to fasten the mounting structure in position with respect thereto. The mounting structure may be trunnioned in the brackets to turn relatively thereto to adjustably position the guide means in desired angular position, and friction clamping means may be



provided acting between the mounting structure and at least one of the two opposed walls to fasten the mounting structure in position with respect thereto. The friction clamping means may comprise opposed friction clamps carried by the mounting structure adapted to engage the respective opposed walls.

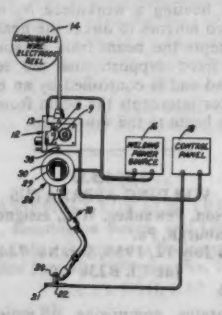
Means are preferably provided for adjustably positioning the weld depositing means transversely of the guide means so that beads of weld metal may be deposited at different controlled locations upon successive passes of the weld depositing means along the guide means for each position in which the guide means are fastened. Means may be provided automatically adjusting the position of the weld-depositing means transversely of the guide means.

3,594,534

WELDING APPARATUS

Edward Andrew Benfield, Chicago, Ill., assignor to Compak-O-Matic, Inc.

Filed Mar. 21, 1969, Ser. No. 809,215
Int. Cl. B23k 9/12
U.S. Cl. 219—125 **8 Claims**



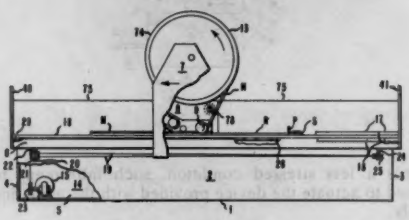
A welding device including a welding head and circular welding mechanism detachably secured thereto. The circular welding mechanism includes a barrel and a housing. The barrel is detachably secured to the housing and rotatably driven by a drive therein so as to make circular inside or outside welds on a workpiece. The barrel comprises a first connection end adapted to be secured to the housing and a second remote end telescopically and angularly adjustable with respect to the connection end.

3,594,535

IMAGE TRANSFER MACHINE FOR GRAPHIC ARTS PHOTOPOLYMER FILM

Victor Fu-Hua Chu, East Brunswick; Abraham Bernard Cohen, Springfield, and Herbert Albert Tobias, New Brunswick, all of, N.J., assignors to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 24, 1968, Ser. No. 700,117
Int. Cl. H05b 1/00
U.S. Cl. 219—216 **12 Claims**



Apparatus for achieving dry image transfer employing photohardenable elements for surface transfer to suitable image-receptive supports. The apparatus comprises

1. means for supporting and holding an image-receptor element in a fixed position with respect to the imagewise exposed photohardenable matrix, and

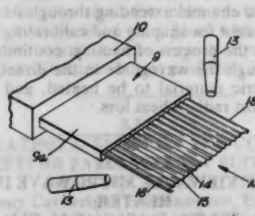
2. a carriage which moves along the laminae of the image-receptor element and matrix element, and which has means for pressing or laminating the elements in surface register, and means for stripping the matrix element from the image-receptor element after lamination.

3,594,536

METHOD AND APPARATUS FOR THE SPARK MACHINING OF WORKPIECES AND A SPARK-MACHINING ELECTRODE FOR USE THEREIN

Irvin Holroyd, Barnoldswick, near Colne, England, assignor to Rolls-Royce Limited, Derby, Derbyshire, England

Filed May 12, 1969, Ser. No. 823,767
Claims priority, application Great Britain, May 14, 1968, 22720/68
Int. Cl. B23k 9/16
U.S. Cl. 219—69 M **12 Claims**



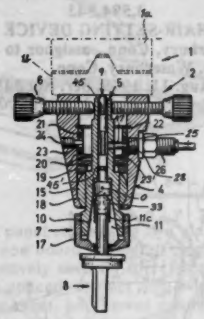
A spark-machining electrode comprises an electrode plate which is corrugated in at least a portion thereof, the corrugations being of greater height than the thickness of the plate and having parallel axes such that, in a spark-machining operation, relative approaching movement between the electrode and a workpiece parallel to the axes of the corrugations will produce at least one narrow elongated cavity having a cross-sectional dimension less than the height of the corrugations.

3,594,537

ANGULARLY ADJUSTABLE HOLDER FOR MACHINE-TOOL BITS

Fritz Morgenegg, Neuhofstrasse, 3422 Kirchberg, Bern, Switzerland

Filed Jan. 29, 1969, Ser. No. 794,855
Claims priority, application Switzerland, Jan. 31, 1968, 1515/68
Int. Cl. B23p 1/08
U.S. Cl. 219—69 8 Claims



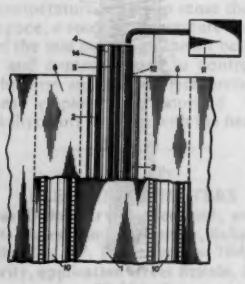
A bit holder depending from a cross-slide or other movable support has a socket with a spherically curved seat for a tubular shaft terminating at the bottom in a chuck designed to clamp a tool bit, specifically a channeled spark-erosion electrode, in alignment with its axis passing through the center of curvature of the spherical seat. The shaft has a spherically curved bulge resting on the seat, under pressure from a spring-loaded retaining ring, and is tiltable about the aforesaid center of curvature under the control of several adjusting screws bearing from different sides upon the upper end of the shaft within the socket. The interior of the shaft above the stem of the electrode is occupied by an ejector rod forming passages for a scavenging fluid between the channeled stem and a flexible hose slidably extending from a lateral opening of the shaft through a nipple seated in a side aperture of the socket.

3,594,538

METHOD OF MOULDED WELDING WITH CONSUMABLE NOZZLE

Johannes Jacobus Broodman, Breskens, Netherlands, assignor to N. V. Koninklijke Maatschappij "De Schelde", Flushing, Netherlands

Filed July 5, 1968, Ser. No. 742,637
Claims priority, application Netherlands, July 5, 1967, 6,709,353
Int. Cl. B23k 9/18
U.S. Cl. 219—73 5 Claims



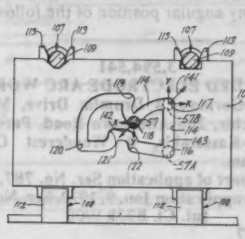
A process of arc welding comprises providing a consumable nozzle disposed at the gap where a butt joint is to be made and disposing a separate electrical conductor wire at the gap to define a measuring probe. The measuring probe measures the arc voltage across the slag pool and the welding current is controlled by the aforesaid measured voltage to maintain the arc voltage or voltage across the slag pool substantially constant.

3,594,539

TEMPLATE FOLLOWER

Thomas J. Gelermann, Bay City, Mich., assignor to Newcor, Inc., Bay City, Mich.

Filed Aug. 25, 1969, Ser. No. 852,700
Int. Cl. B23k 11/24
U.S. Cl. 219—108 11 Claims



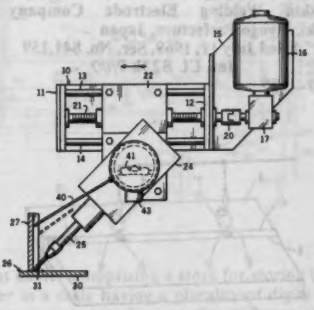
A multiple station workpiece positioning device for positioning a workpiece at different stations relative to welding apparatus for permitting the performance of a plurality of welding operations thereon. The workpiece is mounted on a worktable and is guided for movement in a predetermined pattern by guide means. The guide means comprises a template having guide groove means therein receiving and guiding a follower member secured to the worktable. The guide groove means has a plurality of obstruction means therein to prevent a continued movement of the follower member and to accurately position the worktable at a plurality of stations relative to the welding apparatus. The obstruction means are bypassable by a movement of the worktable so that the follower member moves away from and around the obstruction means to permit a continued movement of the follower member and the worktable in the pattern defined by the guide groove means to the next obstruction means. At each location of the obstruction means, the worktable is accurately positioned relative to the welding apparatus so that appropriate energization of the welding apparatus will accurately place a weld onto a workpiece.

3,594,540

TRACKING TRANSDUCER FOR WELDING APPARATUS

Edward J. Weinfurt, c/o The Pandjiris Weldment Co., 5151 Northrup Ave., St. Louis, Mo.

Filed July 7, 1969, Ser. No. 839,392
Int. Cl. B23k 9/12
U.S. Cl. 219—125 PL 9 Claims



A tracking transducer for welding apparatus having a sensing means carried by a welding head, the sensing means including a follower that engages the workpieces to be joined

together and follows the edge contour, means that oscillatively mounts a follower housing so that the angle of the follower can be varied transversely of the edge, and a variable resistor, responsive to angle of tilt, that is carried by and oscillatively movable with the follower housing as the follower engages the workpiece. Means operatively connect the variable resistor to a motor means for moving the welding head transversely of the edge in a direction to hold the head on the edge in response to any transverse deviation sensed by the follower and at a speed proportional to the deviation. The variable resistor is of a type that causes an increased voltage output proportional to the degree of angle tilt in either direction from a substantially null position. The relative angular position of the variable resistor and follower can be adjusted, whereby the resistor can be located in a substantially null position in any angular position of the follower.

3,594,541

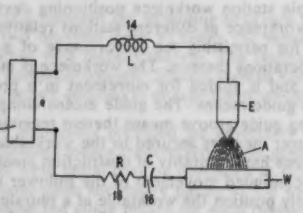
AC SHIELDED ELECTRODE ARC WORKING

Eugene Francis Gorman, 4 Drumlin Drive, Morris Plains, N.J.; John Kochis, 206 Allentown Road, Parsippany, N.J., and George Kassotakis, 4 Woodcrest Court, South Weymouth, Mass.

Continuation-in-part of application Ser. No. 787,120, Dec. 26, 1968. This application Jan. 9, 1970, Ser. No. 1,890

Int. Cl. B23k *9/00*

U.S. Cl. 219—137 **8 Claims**



A method of AC electrode shielded arc working wherein an RLC circuit is included in series with the AC supply source and the electrode for maintaining a continuous AC arc, the magnitudes of the components in the RLC circuit being correlated with the required reignition potential of the shielded atmosphere and the metal oxide surface of the workpiece.

3,594,542

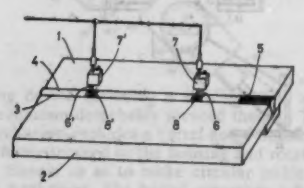
CONTINUOUS LAY DOWN ARC WELDING METHOD

Nobuaki Miyao, Osaka Prefecture; Makoto Shiraki, Osaka Prefecture; Kunihiro Kosuge, Osaka Prefecture; Yukihiro Nanba, Osaka Prefecture; Saijiro Yoshida, Osaka Prefecture; Tatsuo Nakamura, Hyogo Prefecture; Takamichi Uehara, Hyogo Prefecture; Kazushige Matsubara, Hyogo Prefecture; Kanaaki Uchiyama, Osaka Prefecture, and Masajiro Nakata, Hyogo Prefecture, all of, Japan, assignors to Sumikin Welding Electrode Company Limited, Amagasaki, Hyogo Prefecture, Japan

Filed July 11, 1969, Ser. No. 841,159

Int. Cl. B23k *9/00*

U.S. Cl. 219—137 **26 Claims**



This invention is a continuous lay down arc welding method wherein current supplying points are provided at proper intervals on a connected welding electrode or non-connected long welding electrode and current supplying apparatus operated by the arc light or arc heat are set so that unmanned welding may be automatically made only by switching the welder.

ERRATUM

For Class 219—222 see:
Patent No. 3,594,453

3,594,543

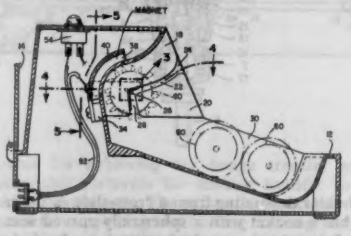
HAIR-SETTING DEVICE

Gus Wallin, Waterbury, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 11, 1969, Ser. No. 848,954

Int. Cl. A45d *4/12*; H05b *1/02*

U.S. Cl. 219—222 **13 Claims**



A hair-setting device comprises a roller containing an electric heating element with exposed contacts and a ferrous alloy having a selected Curie temperature. The device also comprises a charging station having electric current supply contacts and a magnet adjacent the contacts. In use, the roller is held with its contacts in charging engagement with the contacts of the charging station by the attraction of the magnet to the alloy. When the heating element delivers sufficient heat to the alloy, the alloy is no longer attracted to the magnet and the roller drops, ready for use.

3,594,544

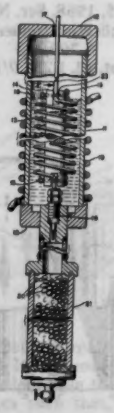
FLUID REACTOR PREHEATER

Donald K. Wunderlich, Riverdale, Ill., assignor to Atlantic Richfield Company

Filed Aug. 30, 1968, Ser. No. 756,549

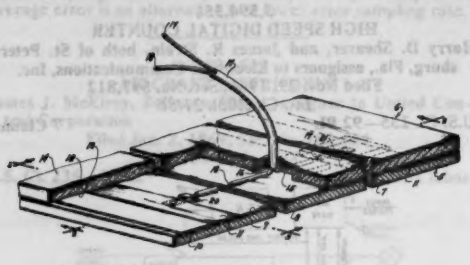
Int. Cl. F24h *1/16, 7/00*

U.S. Cl. 219—302 **5 Claims**



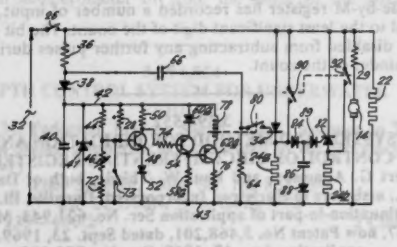
An improved small-scale reactor preheater for heating fluid reactants. The reactants enter the preheater and downflow through a coiled tube immersed in a molten lead bath which is heated by an electrical heater.

3,594,545
RADIANT HEAT PANEL
George W. Green, Portland, Oreg., assignor to Georgia-Pacific Corporation, Portland, Oreg.
Filed July 29, 1969, Ser. No. 845,836
Int. Cl. H05b 1/00, 3/34
U.S. Cl. 219—345 10 Claims



A radiant heat panel comprising two plasterboards in face-to-face relation, one board having an electrically conductive paper sheet adhesively secured thereto, and current supply means including spaced contact strips laminated with the conductive paper sheet, and power connections attached to the contact strips and lying between the planes of the opposite faces of the other of the two plasterboards of which the panel is formed.

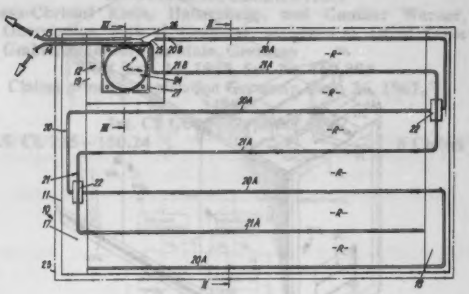
3,594,546
AIR TEMPERATURE CONTROL APPARATUS
George Horn Smillie, and Frank Johnstone, both of Glasgow, Scotland, assignors to Tronapplics Limited, East Kilbridge, Scotland
Filed Sept. 10, 1969, Ser. No. 856,587
Claims priority, application Great Britain, Sept. 13, 1968, 43,742/68
Int. Cl. H05b 1/02
U.S. Cl. 219—501 18 Claims



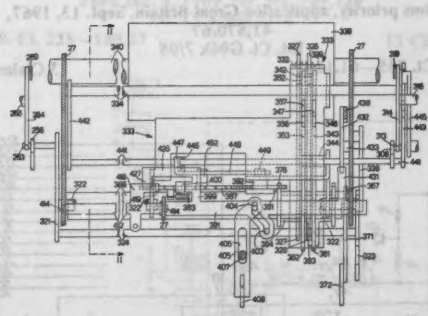
Apparatus to regulate the temperature of the air in a room comprises a fan to circulate a portion of the air through a heater and to thereafter return the portion of air to the space, a first temperature sensor to sense the temperature of the air in the space, a second temperature sensor to sense the temperature of the said portion of the air before it is returned to the space and control means to control the heater in response to the first and second temperature sensors. The control means employs transistorized voltage-sensitive switching, and thyristors in series with the heater elements.

3,594,547
ELECTRICAL HEATERS
Joseph Thomas Quinn, Irvine, Scotland, assignor to Space Age Products (Sales) Limited, Nassau, Bahamas
Filed Dec. 17, 1968, Ser. No. 784,431
Claims priority, application Great Britain, Dec. 23, 1967, 58,578/67
Int. Cl. H05b 1/02, 3/34
U.S. Cl. 219—529 5 Claims

An electrical heater for use in heating the engine, battery, seat or rear window of an automobile includes a thin, flexible rectangular heating pad embodying a composite electrical resistance sheet, a time switch mounted on the pad at a corner thereof and a pair of leads extending from the corner to provide for the operative connection of the heater to the vehicle battery. The pad comprises a resistance sheet composed of a flexible substrate of glass cloth having a coating of electrically resistive material on one surface. Header and distributor conductors an electrical contact with the face of the coating and connectable to said leads through the time switch are formed by a pair of elongated flexible braided wire electrodes extending sinuously across the coating and stitched to the sheet. Each electrode forms a plurality of U-shaped portions. The electrodes cross each other near their U-bases so that longitudinal stretches of one electrode alternate with longitudinal stretches of the other. The electrodes are electrically insulated from each other at the crossings.



3,594,548
DIGITAL PRINTOUT DEVICE
Ettore Abbiati, Ivrea (Torino), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed June 16, 1969, Ser. No. 833,506
Claims priority, application Italy, June 28, 1968, 52,214-A/68
Int. Cl. G06c 29/00; G06f 5/02
U.S. Cl. 235—61 10 Claims



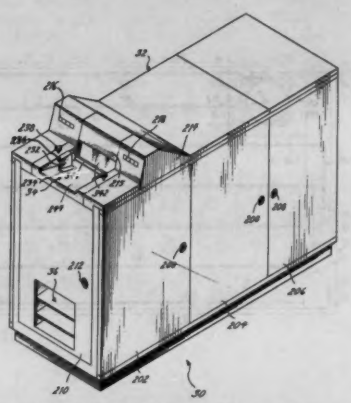
Printout device comprising a store for storing the values of each order in a code having a plurality of digits and a series of characters corresponding to the different values of an order arranged so that a selected character is brought to a printing position by moving the characters according to a plurality of coordinates, the movement along each coordinate being controlled by a corresponding code digit.

3,594,549

DOCUMENT HANDLER

Alan I. Frank, Philadelphia, and Stanley M. Oster, Blue Bell, both of, Pa., assignors to Scan-Data Corporation, Norristown, Pa.

Filed June 5, 1968, Ser. No. 734,777
Int. Cl. G06k 7/14; B65h 5/08; B65k 3/06
U.S. Cl. 235—61.11 E 13 Claims



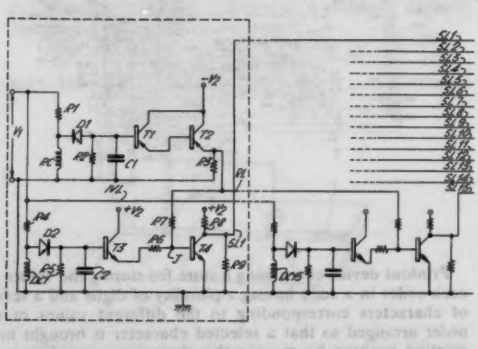
A document handler for character recognition systems. The document handler comprises an input bin for insertion of documents, transport means for carrying the documents and an output bin for the reception of documents from the transport means. Means for sensing a document are provided adjacent the transport means for determining the location of the document on the transport means. The character recognition system includes means for reading the document at a predetermined location relative to the transport means. The movement of the transport means is controlled in accordance with the information generated by the sensing means and the character recognition system to maximize the speed of handling of the document and reading thereof.

3,594,550

METHODS OF AND APPARATUS FOR IDENTIFYING ARTICLES, E. G. IN AN AUTOMATICALLY CONTROLLED SYSTEM

David Theodore Nelson Williamson; Douglas William Ballantyne Muir; Richard Graham Grosland, and Edward Henry Parke, all of Deptford, England, assignors to Molins Machine Company Limited, London, England

Filed Sept. 13, 1968, Ser. No. 759,740
Claims priority, application Great Britain, Sept. 13, 1967, 41,870/67
Int. Cl. G06k 7/08
U.S. Cl. 235—61.11 D 3 Claims



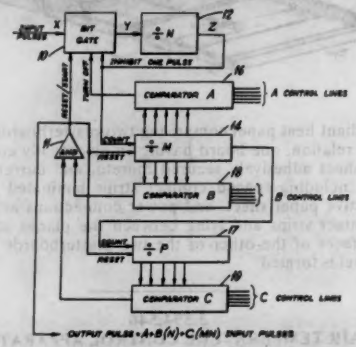
Apparatus for sensing identifying markings on articles, consisting of markers of two kinds, magnetic and nonmagnetic, selected to represent a binary number (the two kinds of marker corresponding to the digits 0 and 1) comprises one or more electromagnetic sensing devices, each device having a magnetic circuit into which a marker can be placed to produce an electric output governed by the reluctance of the magnetic circuit.

3,594,551

HIGH SPEED DIGITAL COUNTER

Harry D. Shearer, and James R. Strain, both of St. Petersburg, Fla., assignors to Electronic Communications, Inc.

Filed Nov. 29, 1966, Ser. No. 597,812
Int. Cl. H03k 21/36
U.S. Cl. 235—92 PL 7 Claims



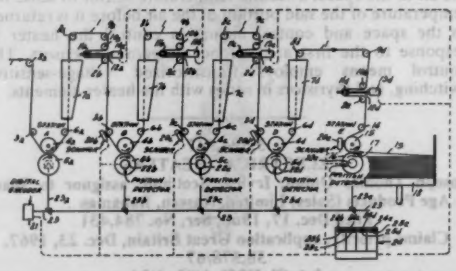
The input pulses to be counted are supplied to a bit gate and from there are passed to a Divide-by-N circuit. The output of the Divide-by-N circuit is supplied to both a Divide-by-N circuit and back to the bit gate. The pulse being resupplied to the bit gate is employed to inhibit one pulse from passing through the bit gate. After N input pulses have been received, one pulse is inhibited and a one count is recorded by the Divide-by-M register. This process continues until the Divide-by-M register has recorded a number of input pulses equal to the least significant digit of the count. The bit gate is then disabled from subtracting any further pulses during the remainder of the count.

3,594,552

SYSTEM AND METHOD FOR INDICATION AND CONTROL OF CIRCUMFERENTIAL REGISTER

Robert G. Adamson, and Paul W. Thiede, both of Danville, Ill., assignors to Hurletron Incorporated, Danville, Ill.

Continuation-in-part of application Ser. No. 621,943, Mar. 9, 1967, now Patent No. 3,468,201, dated Sept. 23, 1969. This application Apr. 17, 1968, Ser. No. 722,095
Int. Cl. G06m 3/02; B41f 33/02
U.S. Cl. 235—92 MP 29 Claims



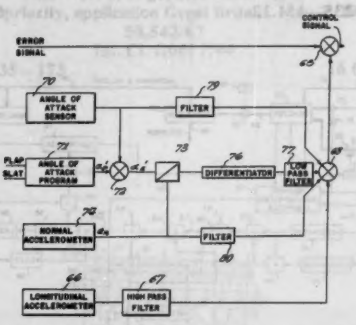
A system is disclosed for indicating and controlling register between repetitive patterns of work applied to a moving web, wherein a digital encoder is rotated in synchronism with rota-

tion of work-performing members, and by counting encoder pulses any error in register at respective work stations may be displayed and/or utilized for automatic control purposes. Counter circuitry is utilized both to facilitate set up of the system and to provide a precisely adjustable digital set point for error determination in operation. Provision is made for a high error sampling rate for automatic control and a lower error sampling rate for digital display. A digital display of average error is an alternative to a lower error sampling rate.

3,594,553
AIRCRAFT INSTRUMENT

James J. McElroy, Bellevue, Wash., assignor to United Control Corporation

Filed Jan. 2, 1969, Ser. No. 788,454
Int. Cl. G06g 7/78
U.S. Cl. 235—150.2 21 Claims

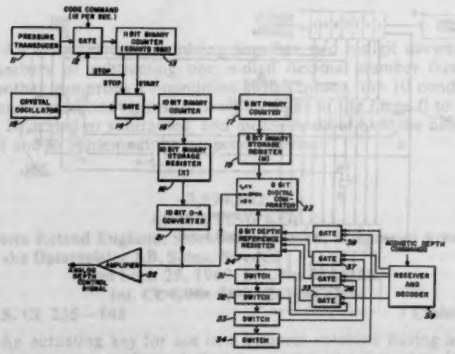


An aircraft control instrument utilizing a signal which represents the error between an actual condition of the aircraft and a desired condition, as an error or deviation from a programmed angle of attack. The error signal is damped by a composite signal having both long term and short term damping information. The long term information is obtained from an angle of attack signal and a normal acceleration signal. The short term damping information is obtained from a longitudinal accelerometer or from the angle of the aircraft elevator.

3,594,554
DEPTH CONTROL SYSTEM FOR UNDERWATER VEHICLE

Arthur M. Pederson, Mercer Island, Wash., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 10, 1969, Ser. No. 831,950
Int. Cl. G06f 15/50; G06g 7/78
U.S. Cl. 235—150.2 2 Claims

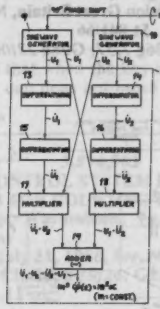


A depth control system for an underwater vehicle having a pressure transducer for providing a frequency output proportional to depth and having means for comparing the measured depth with a preset depth. The output frequency of the pressure transducer is accurately measured by a high frequency crystal-controlled oscillator and counter and this high frequency count is stored in a binary register and compared with a reference register to determine whether the pressure is greater, less than, or approximately equal to the preset value.

3,594,555
METHOD OF AND APPARATUS FOR MEASURING ANGULAR ACCELERATION

Hans-Christof Klein, Hattersheim, and Gunther Werner, Oberstedten, both of, Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Germany

Filed Sept. 19, 1968, Ser. No. 760,894
Claims priority, application Germany, Sept. 26, 1967, T 34884
Int. Cl. G06g 7/78; B60t 8/08
U.S. Cl. 235—150.24 6 Claims



In order to measure angular acceleration, two sine wave signals U_1 and U_2 of a frequency determined by the angular velocity are generated by a rotating body, preferably a vehicle wheel. These signals U_1 and U_2, and their time derivatives are combined to produce an output corresponding to the second time derivative of angular displacement $\Phi(t)$ (i.e. angular acceleration) in accordance with the relationship:

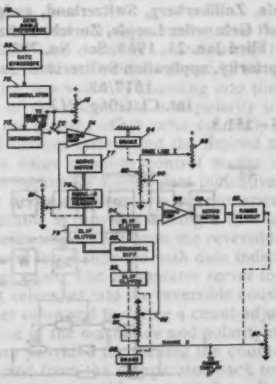
$$\dot{U}_2 U_1 - U_1 \dot{U}_2 = m^2 \ddot{\Phi}(t) \; (m^2 = U_1^2 + U_2^2).$$

The output controls an antiskid system for the brake.

3,594,556
OPTICAL SIGHT WITH ELECTRONIC IMAGE STABILIZATION

William R. Edwards, California, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 8, 1969, Ser. No. 789,729
Int. Cl. G06g 7/78
U.S. Cl. 235—150.27 11 Claims



This invention is directed to an electrically augmented sight particularly adapted for use in aerial reconnaissance.

The sight locates and fixes the position of an object viewed from the air. A wide-angle optical viewer is used to locate and hold the object in sight. An electron image motion-stabilizing system in the sight provides a stable view of the object. When the stable view is obtained, computer operation is initiated to make two consecutive measurements of the bearing angle of the target relative to the flight path of the aircraft. After the aircraft has traveled a predetermined distance, usually 1,000 yards, the second measurement is made. The bearing angle at the point of the second measurement is recorded and the computer utilizing the sine law calculates the range of the target at the recorded bearing.

3,594,557

METHOD FOR THE AUTOMATIC CONTROL OF A PROCESS VARIABLE

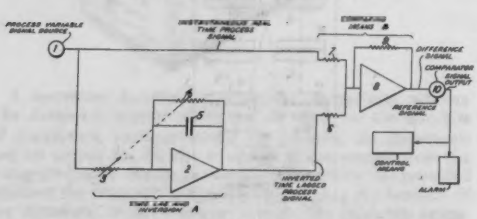
James Spence Anderson, Norton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 6, 1967, Ser. No. 680,729

Claims priority, application Great Britain, Nov. 18, 1966, 51,841/66

Int. Cl. G06g 7/57; G08b 23/00

U.S. Cl. 235—151.1 **3 Claims**



The invention is drawn to a method for the automatic control of a process variable particularly a hazardous variable such as the flow rate of an inflammable gas, e.g. oxygen. Signals representing the variable are fed to a computer whereby they are lagged before being compared with subsequent signals. The difference between the lagged and unlagged signals may then be compared with a fixed signal representing a preset critical value to the variable. When this latter value is exceeded remedial action is taken. Preferably the lagged signal is emitted in exponential form, so permitting controlled increases in the variable to be made more readily. The invention is of particular use in systems involving gas recirculation in which an accidental increase in gas flow rate is magnified by the recirculation system.

3,594,558

PROCESS AND APPARATUS FOR DETERMINING THE ACTION OF AN ELECTRONIC THREAD CLEANER

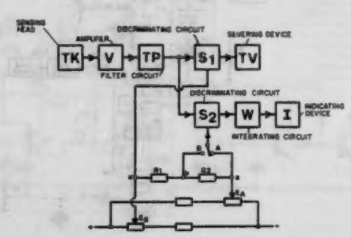
Erich Loepfe, Zollikerberg, Switzerland, assignor to Aktiengesellschaft Gebrueder Loepfe, Zurich, Switzerland

Filed Jan. 21, 1969, Ser. No. 792,332

Claims priority, application Switzerland, Jan. 31, 1968, 1517/68

Int. Cl. G06g 7/12

U.S. Cl. 235—151.3 **11 Claims**



The cleaning action of an electronic thread cleaner is determined by calculating from variations in time of the thickness of a thread at least one value determined by the appearance of frequent variations in thickness, the value being that of a suitably selected auxiliary quantity which can be determined in the range of frequent thickness variations as well as the range of rare thickness variations. Then the cleaning action can be determined on the basis of this value or values by extrapolation of the course of this auxiliary quantity depending upon the set parameters of the thread cleaner within the range of the rare deviations in thickness.

3,594,559

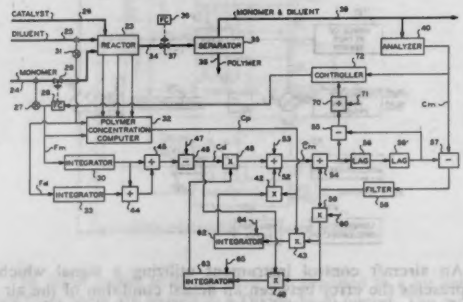
PROCESS CONTROL FOR POLYMERIZATION CONTROL SYSTEM HAVING EQUATION UPDATING FEEDBACK NETWORKS

Troy J. Pemberton, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed June 26, 1968, Ser. No. 740,251

Int. Cl. G06g 7/58

U.S. Cl. 235—151.12 **6 Claims**



Emperical equations of type $Y=A_1X_1+AX_2+...+A_nX_n$, employed in automatic control systems, are updated continuously in response to measurements of the process being controlled. The updating is accomplished by a computer having feedback networks. The equation updating network is employed in a polymerization control system.

3,594,560

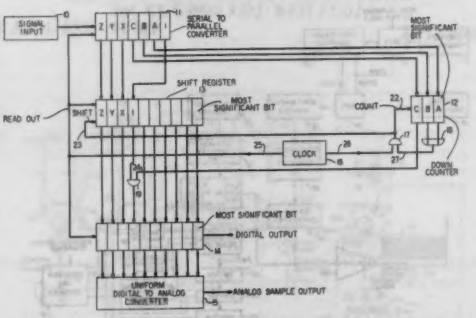
DIGITAL EXPANDOR CIRCUIT

Thomas P. Stanley, Falls Church, Va., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Jan. 3, 1969, Ser. No. 788,754

Int. Cl. G06f 5/00

U.S. Cl. 235—154 **3 Claims**



The digital expandor circuit disclosed operates on digital words which have been compressed in accordance with a prescribed format. By this format each of the compressed words contains two groups of digits, one group called the

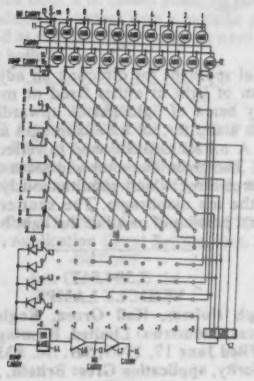
characteristic and another group called the mantissa. The digits of the characteristic are read into a counter circuit, and the digits of the mantissa together with a digit representing the most significant digit in the expanded digital word are read into a shift register. A common clock source controls both the counter and the shift register such that the mantissa group of digits is shifted in the register each time a counting signal is sent to the counter. In response to the values of the digits in the counter, logic circuitry regulates the counting signal and determines which of the digits in the shift register should be read to an output circuit to produce the expanded digital word.

3,594,561

DECIMAL DATA-HANDLING EQUIPMENT

Arthur L. Whitwell, 11 Watt Road, Hillington, Glasgow, S.W. 2, Scotland

Filed Nov. 4, 1968, Ser. No. 773,089
Claims priority, application Great Britain, Nov. 7, 1967, 50,542/67
Int. Cl. G06f *7/44*
U.S. Cl. 235—173 **16 Claims**



An arrangement for adding together two *n*-digit decimal numbers or subtracting one *n*-digit decimal number from another comprises 10-condition switch means, the 10 conditions corresponding respectively to digits in the range 0 to 9 to be added or subtracted, and means to determine the need for and to implement the necessary carries.

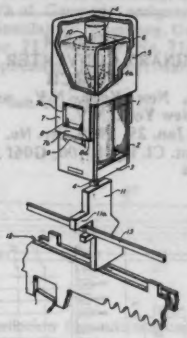
3,594,562

ACTUATING KEY

Gosta Roland Englund, Stockholm, Sweden, assignor to Svenska Dataregister AB, Solna, Sweden

Filed Sept. 25, 1969, Ser. No. 861,011
Int. Cl. G06c *7/02;* **B41j** *5/12*
U.S. Cl. 235—145 **7 Claims**

An actuating key for use in a business machine having an electromagnet positioned therein so that the key may be operated by actuation of the electromagnet or may be actuated manually by the depression of the key cap. The key cap partially covers the electromagnet so as to prevent foreign matter from entering the mechanism and interfering with its operation. Also the core of the electromagnet is not attached



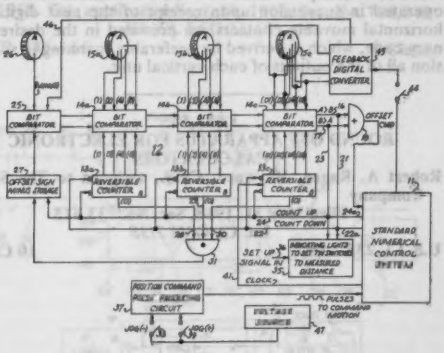
to the key cap so that when the key is operated electromagnetically, the key cap does not move to the depressed position.

3,594,563

NUMERICAL CONTROL SYSTEM HAVING IMPROVED MEANS FOR COUNTING IN OFFSETS

Everett R. Bishop, Waynesboro, Va., assignor to General Electric Company

Filed July 31, 1968, Ser. No. 749,032
Int. Cl. G05b *19/24;* **G12b** *13/00*
U.S. Cl. 235—151.11 **15 Claims**



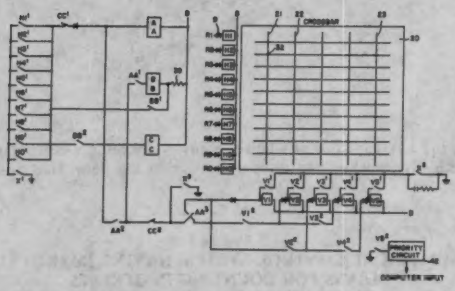
A new and improved numerical control system is described which has an offset value count-in control means for adjusting the current value of an offset being used by the numerical control system to a new value by counting into the system a count indicative of the magnitude and polarity of the difference between the existing offset value currently employed by the numerical control system and the desired new offset value. The offset value count-in control means comprises reversible counter means for storing data indicative of a current offset value being employed by the numerical control system. A comparator is provided having a first input coupled to a value indicating output from the reversible counter and having a second input supplied with data indicative of a new or input offset value. The comparator serves to compare the existing offset values set into the reversible counter to the new or input offset value and to derive a count-adjusting output signal indicative of the magnitude and polarity of any difference. Means are provided for feeding the count-adjusting output signal derived from the comparator back to a count-adjusting input to the reversible counter for adjusting the count contained in the reversible counter to a value corresponding to the new or input offset value. Means are also

provided for supplying this count-adjusting output signal from the comparator to the numerical control system for adjusting the offset value being employed by the numerical control system to the new or input offset value.

3,594,564
DECIMAL-TO-BINARY CONVERTER WITH CROSSBAR SWITCH

Robert F. Kane, New York, N.Y., assignor to Dialscan Systems, Inc., New York, N.Y.

Filed Jan. 29, 1969, Ser. No. 794,923
Int. Cl. H04l 3/00; G06f 3/00
U.S. Cl. 235—154 9 Claims

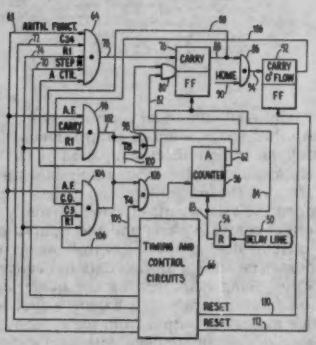


A decimal-to-binary or alpha-numeric-to-binary converter is described for converting telephone dial pulses or tones into binary coded form for transmission to a computer for processing. A crossbar switch is used, whose horizontals are associated with particular characters and whose verticals are operated in succession upon receipt of the next digit. The horizontal movable contacts are prewired in the desired binary code, which is derived by preferably scanning in succession all of the outputs of each vertical unit.

3,594,565
ROUND OFF APPARATUS FOR ELECTRONIC CALCULATORS

Robert A. Ragen, Hayward, Calif., assignor to The Singer Company

Filed May 31, 1968, Ser. No. 733,515
Int. Cl. G06f 7/38
U.S. Cl. 235—160 10 Claims

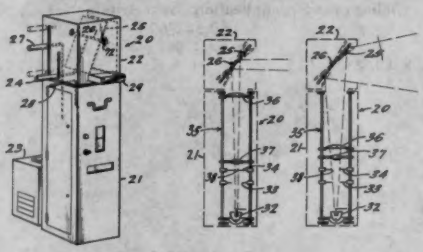


Rounding off numbers in a desk top electronic calculator having a data train that recirculates in accordance with a predetermined sequence is accomplished by sensing whether the numeral in the next least significant digit position following the least significant digit position of interest is five or greater when it occurs in a predetermined location of the data train. When the numeral is five or greater, this condition is temporarily stored. Gating means coupled to the storage and to control signals indicative of the occurrence of the least significant digit position of interest in a predetermined location of the data train enables the numeral in the least significant digit position of interest to be increased by one. Much of the circuitry utilized to perform round off is also used to perform a carry function as arithmetically required.

3,594,566
LIGHT PROJECTOR

Richard F. Kneisley, Toledo, Ohio, assignor to The Kneisley Electric Company, Toledo, Ohio

Filed Oct. 13, 1969, Ser. No. 865,858
Int. Cl. F21p 5/00
U.S. Cl. 240—3 7 Claims

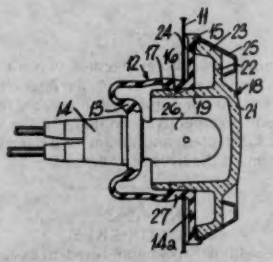


A theatrical spotlight for directing an adjustable diameter focused beam of light at either fixed or moving objects. A high-intensity beam of light passes upwardly from a xenon lamp through a shutter, an iris diaphragm and an adjustable lens system. A mirror is positioned to reflect the light beam to the target. The beam diameter and focus are adjusted with a single control lever which simultaneously adjusts the lens system and the iris diaphragm. The shutter is adjustable to cut off either a portion of or all of the light beam.

3,594,567
VEHICLE LAMPS

Dennis Joseph Holmes, Hall Green, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 17, 1969, Ser. No. 833,919
Claims priority, application Great Britain, June 28, 1968, 30903/68
Int. Cl. B60q 3/04
U.S. Cl. 240—8.16 2 Claims



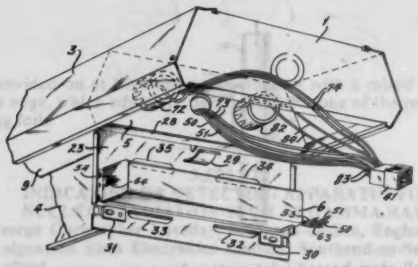
A vehicle lamp includes a flexible cup-shaped body which supports a bulb and has an outwardly directed flange at its open end. Engageable with the body is a relatively rigid lens member including a portion received as a close fit within the body. The body is inserted through a hole in a panel, with the flange engaged with one face of the panel. The lens member is then engaged with the body and deforms said portion of the lens member to retain the lamp in position.

3,594,568

LUMINAIRE

Edwin F. Guth, Jr., St. Louis, Mo., assignor to The Edwin F. Guth Company, St. Louis, Mo.

Filed July 16, 1968, Ser. No. 745,219
Int. Cl. H05b 33/02
U.S. Cl. 240—51.11 R 2 Claims



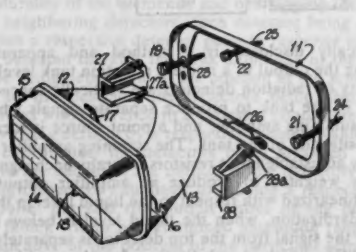
Luminaire for fluorescent lamps in which the ballast is housed in a compartment of the luminaire at one end of the lamps, and the compartment is provided with a downwardly opening, detachably hinged, door upon which the ballast is mounted. When the door is in closed position, the ballast casing is in heat-conductive contact with a metallic part which is exteriorly exposed at the top of the compartment for dissipating heat from the ballast.

3,594,569

RECTANGULAR ADJUSTABLE HEADLAMP ASSEMBLY FOR ROAD VEHICLES

John Webster Cranmore, Moseley, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Oct. 21, 1968, Ser. No. 769,170
Claims priority, application Great Britain, Oct. 27, 1967, 48871/67
Int. Cl. F21v 21/14
U.S. Cl. 240—44 5 Claims



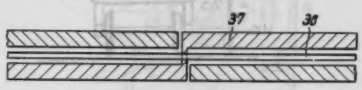
A headlamp assembly includes a rectangular lamp unit having a pair of flanges which project from opposite sides of the unit respectively. The flanges lie on an imaginary line parallel with the horizontal axis of the lamp unit, and has engaged therewith respective screws. The screws are engaged at one end with the flanges for angular movement relative to the flanges, and are engaged at their opposite ends with respective nuts which are affixed to a support member. The arrangement is such that rotation of one of the screws in a direction to move its respective flange towards the support member while rotating the other screw through the same angular distance but in a direction to move its respective flange away from the support member, so as to adjust the attitude of the lamp unit with respect to the support member about a vertical axis passing through the midpoint of said imaginary line.

3,594,570

VEHICULAR GUIDANCE SYSTEM WITH COLLISION PREVENTION

Horst Schonbrodt, Stemwarde, Hamburg, and Volkmar Listing, Hamburg, both of, Germany, assignors to H. Jungheinrich & Co. Maschinenfabrik, Hamburg, Germany

Filed Mar. 21, 1968, Ser. No. 714,927
Claims priority, application Germany, Mar. 23, 1967, J 33 283
Int. Cl. B61l 23/10
U.S. Cl. 246—66 5 Claims



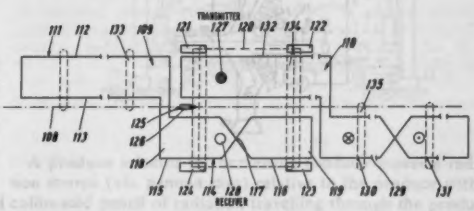
An improved installation for automatically guiding transportation vehicles along a track by means of a guide element defining and determining the track, wherein the improvement comprises means effectively preventing a collision of vehicles moving along the track at different speeds, without protruding into the path between the vehicles; the invention also comprises a guide rail and a transportation vehicle adapted to be used in such an installation.

3,594,571

VEHICULAR GUIDANCE SYSTEM WITH COLLISION PREVENTION

Horst Schonbrodt, Stamwarde, Hamburg, and Volkmar Listing, Hamburg, both of, Germany, assignors to H. Jungheinrich & Co. Maschinenfabrik, Hamburg, Germany

Continuation-in-part of application Ser. No. 714,927, Mar. 21, 1968. This application Sept. 19, 1968, Ser. No. 760,848
Int. Cl. B61l 23/16
U.S. Cl. 246—66 5 Claims



A vehicular guidance system for self-propelled vehicles moving along a track includes a series of elongate conductors following one another in overlapping relationship, each conductor having a leading portion on one side and a trailing portion on the other side of the track for cooperation with a high frequency transmitter and a corresponding receiver, respectively, aboard each vehicle. With the length of each conductor portion exceeding that of a vehicle, signals picked up by the receiver of one vehicle indicate the presence of another vehicle immediately ahead.

3,594,572

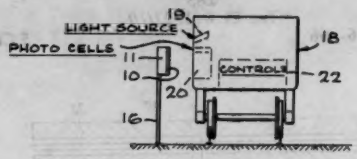
WAYSIDE CONTROL SYSTEM

Geza Horeczky, Pacific Palisades, Calif., assignor to The Dashaveyor Company, Venice, Calif.

Filed Apr. 10, 1969, Ser. No. 815,005
Int. Cl. B61l 3/22
U.S. Cl. 246—187 B 12 Claims

A system for automatically controlling a train employs a control means extending parallel to and along the length of the track wayside which represents information for controlling the train motion, for example. Means are provided on the train for scanning the control means and producing a

velocity control signal based on the ratio of two different light radiations provided by the control means for example.



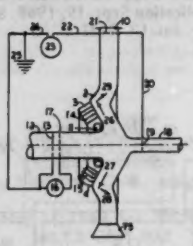
This control signal is applied to the motor control system of the train to determine motor speed and thus, train velocity.

3,594,573

ELECTROMAGNETIC DEVICE FOR SEPARATION OF FLUID ISOTOPES

Henry Greber, 225 West, 80 St., Apt. 8-D, New York, N.Y.

Filed June 20, 1968, Ser. No. 738,542
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 1 Claim



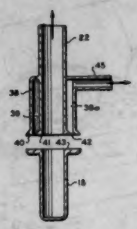
This invention is related to an electromagnetic device for separation of the heavier isotopes from the lighter from a mixture of the two in fluid, particularly in gaseous state. This device consists of an essentially cylindrical enclosure with at least one of its circular walls covered with *n* coils, whose centerlines are spaced from each other by angles equal to $360°/n$, and are fed from an *n*-phase source of AC, with each phase passed at least through a half-wave rectifier. Said coils create a radial magnetic field which rotates around the longitudinal axis of said cylindrical enclosure. The rotating magnetic field acting on positive ions of the gas pushes then toward the periphery of said enclosure. The ionization of said gas is brought about by means of a radioactive material emanating ionizing radiation, and/or a corona, or arc discharge between two electrodes, with the space between them passed by the gas. The ions of the lighter isotope, due to its smaller mass, have a larger velocity than have the ions of the heavier isotope. Therefore, the ions of lighter isotope are gathered at the periphery of said enclosure, from where they are directed through pipes, whereas the ions of the heavier isotope leave said enclosure near its center. Said difference in velocities of the ions of the different isotopes can also be achieved by means of a toroidal coil arranged at an entrance nozzle to said enclosure.

3,594,574

ALL-GLASS HEATED INLET SYSTEM FOR MASS SPECTROSCOPE WITH SAMPLE CHAMBER VACUUM SEAL

Thomas D. Morgan, and Robert J. Brunfeldt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Feb. 27, 1969, Ser. No. 802,936
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 S 4 Claims



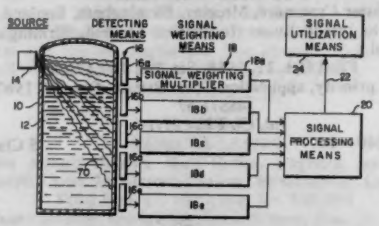
An all glass heated inlet system for a mass spectroscope. The inlet system includes a valved manifold and a vacuum lock for sealingly connecting a sample container to the manifold.

3,594,575

LINEARIZATION OF RADIATION GAUGES FOR MEASURING THE QUANTITY OF FLUIDIC MATERIALS IN CONTAINERS

David J. Shoemaker, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Aug. 30, 1968, Ser. No. 756,471
U.S. Cl. 250—43.5 15 Claims



Specifically disclosed is a method and apparatus for linearizing the output of a nuclear radiation tank level gauge. A plurality of radiation detectors are vertically spaced along one side of the tank to produce separate signals which are fed to a summing amplifier and a point source is located on the opposite side of the tank. The summing amplifier has individually adjustable input resistors whereby each signal is individually weighted to produce an amplifier output signal which is linearized with respect to the liquid level in the tank. For standardization, when the liquid level is below the top detector, the signal from the top detector is separately fed to the amplifier input in substitution for the multiple input signals, and the gain of the measuring system is adjusted to compensate for changed parameters of the system.

3,594,576

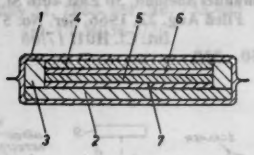
X-RAY FILM HOLDER INCLUDING AN EVACUABLE ALUMINUM ENVELOPE

Hans Josef Muller-rech, Schrobenhausen, and Theodor Fischer, Hannover, both of, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 4, 1969, Ser. No. 830,325
Claims priority, application Germany, Dec. 4, 1968, P 18 12 664.2
Int. Cl. G03b *41/16*
U.S. Cl. 250—68 4 Claims

An X-ray film holder comprising a cover of laminated foil, prepared from an aluminum bag coated on both sides, and of

a bottom plate for supporting the X-ray film which is arranged between two intensifying foils, the bottom plate being



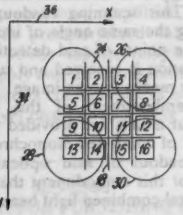
provided on at least three sides thereof with a raised border or edge, which edges are tightly joined to one of the reinforcing foils.

3,594,577

INDICATING OR DETECTING APPARATUS FOR NUCLEAR RADIATION SUCH AS GAMMA RAYS

George Christopher Loveday, Southend-on-Sea, England, assignor to Ekco Electronics Limited, Southend-on-Sea, England

Filed Dec. 2, 1968, Ser. No. 780,465
Claims priority, application Great Britain, Dec. 7, 1967, 55591/67
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 13 Claims



A gamma ray indicating or detecting apparatus comprising a mosaic of scintillator elements adapted to produce scintillations, a plurality of scintillation detectors arranged to view the elements, the field of view of each detector extending over a plurality of the elements, and overlapping the field of view of neighboring detectors, each detector being adapted to produce a respective detector pulse in response to a scintillation detected thereby, the peak amplitude of the respective pulse being dependent on the position of the scintillation relative to the detector, the detectors being arranged in parallel rows with reference to a cartesian coordinate system, each row being defined by a respective constant value of one of said coordinates, the detectors being arranged in rows parallel to the elements, the outputs of the detectors in each row being respectively summed to provide a respective row output pulse, the said row output pulses having peak amplitudes falling within predetermined amplitude ranges, and being indicative of the position of the particular scintillation element in the mosaic in which any particular scintillation occurs.

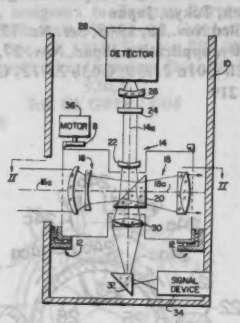
3,594,578

LINE SCANNER FOR INFRARED RADIATION

Claes Thomas Ohman, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Nov. 19, 1969, Ser. No. 878,069
Claims priority, application Sweden, Nov. 29, 1968, 16280/69
Int. Cl. H01j 3/14
U.S. Cl. 250—83.3 13 Claims

A line scanner for infrared radiation includes a rotatable unit which houses two optical systems, each responsive to different ranges of wavelength. A deflector arrangement deflects the optical axes of these systems in two directions along the axis of rotation of the unit. The first optical system is connected to an infrared detector whereas the second system is used for orientation purposes either by (1) forming



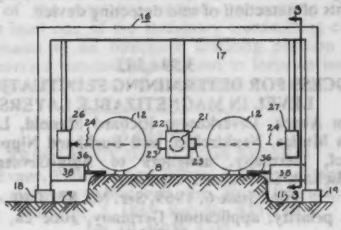
a visible image of the field to be scanned or (2) emitting light pulses in a predetermined direction for reference.

3,594,579

DEVICE AND METHOD USING GAMMA RAYS FOR SIZE AND DENSITY PRODUCE SELECTION

Roger E. Garrett, and Wilson K. Talley, both of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed June 6, 1968, Ser. No. 735,083
Int. Cl. G01t 1/202; G01n 9/24, 23/06
U.S. Cl. 250—83.3 1 Claim



A produce selector for harvesting produce moves a radiation source (viz. gamma rays) relative to the produce with a collimated pencil of radiation travelling through the produce to a receiver on the other side of the produce. The response of the receiver is a direct signal. This may be integrated to provide an indirect signal. These signals are used individually or together to afford a final response. A response exceeding a threshold value can be used to actuate a harvester. The method of selecting produce involves sending a signal through the produce, the signal being attenuated in accordance with the density and size (viz. thickness), and determining the value of the attenuated signal.

3,594,580

CHLORINE DIOXIDE PROCESS II

Gothe Oscar Westerlund, Vancouver, British Columbia, Canada, assignor to Chemech Engineering Ltd., Vancouver, British Columbia, Canada

Division of Ser. No. 675,272, Oct. 2, 1967, Pat. No. 3,524,728.
Filed Apr. 16, 1969, Ser. No. 832,530
Int. Cl. C01b 11/02
U.S. Cl. 252—187 10 Claims

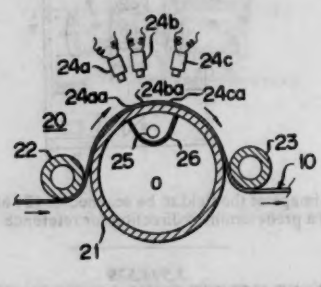
A continuous recyclic process and apparatus for the production of chlorine dioxide from an aqueous chloration solution of gaseous hydrochloride. The hydrogen chloride is formed in situ by combustion of hydrogen gas and chlorine gas. The chlorine dioxide is used for bleaching pulp.

3,594,581

ROLL MICROFILM AND RETRIEVING DEVICE AND METHOD OF RETRIEVING

Hajime Yamashita, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Nov. 20, 1968, Ser. No. 777,301
Claims priority, application Japan, Nov. 27, 1967, 75988/67
Int. Cl. G01n 21/30; G03b 23/12; G06k 7/14
U.S. Cl. 250—219 8 Claims



A roll microfilm-retrieving device wherein a plurality of small signal marks disposed in a predetermined unequally spaced relation with respect to each other in each side edge portion of each of frames of the film are detected by a detecting device wherein a plurality of detecting elements whose number is the same with that of signal marks are disposed in the same relation with said relation of said marks, whereby a desired frame is located or retrieved by a number or counts of detection of said detecting device.

3,594,582

PROCESS FOR DETERMINING FLUCTUATIONS IN LEVEL IN MAGNETIZABLE LAYERS

Wilhelm Abeck, Leverkusen; Richard Menold, Leverkusen; Erich Muller, Neukirchen, and Burkhard Nippe, Munich, all of, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 6, 1969, Ser. No. 831,040
Claims priority, application Germany, June 26, 1968, P 17 72 725.2
Int. Cl. G01n 21/32
U.S. Cl. 250—219 DF 4 Claims

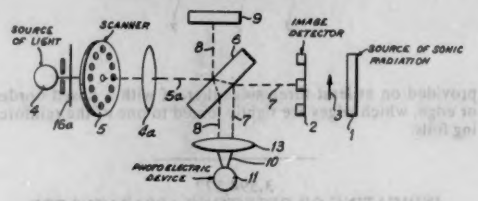
The invention relates to a process for optical detecting fluctuations in level in magnetizable layers of recording materials, wherein a beam of electromagnetic waves is made to fall on the moving magnetizable layer and the intensity of the scattered radiation emitted is measured. The variations in the structure of the magnetizable layers reach the surface and thus alter the optical behavior of the magnetizable layer. The process is suitable for continuous checking of magnetizable tapes during the manufacturing process.

3,594,583

ELECTRO-OPTICAL DEVICES FOR DETECTING IMAGES OF INVISIBLE RADIATIONS USING INTERACTION OF LIGHT BEAMS

Edward Emanuel Sheldon, 30 East 40th St., New York, N.Y.

Filed Aug. 22, 1966, Ser. No. 573,932
Int. Cl. H01l 17/00
U.S. Cl. 250—220 18 Claims



This invention relates to devices for detecting images of invisible radiations and reproducing them as visible images. These devices are provided with detecting means which upon irradiation by a beam of invisible radiation carrying the image of the examined body exhibit various "optical" changes. These changes are analyzed in a scanning mode point after point by a monochromatic light beam which after recombination with nonmodulated part of said monochromatic light beam provides readout information about said invisible image. This scanning readout is characterized by means providing the same angle of incidence of light beams on all successive points of said detecting means. The above readout information is received and subsequently converted by photoelectric means into an image.

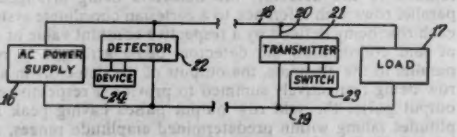
In another embodiment of this invention instead of scanning readout means are provided to produce simultaneously a plurality of combined monochromatic light beams for simultaneous readout of said optical changes. It is also characteristic for this embodiment that photoelectric means receive said plural combined light beams simultaneously.

3,594,584

TELEMETRY CIRCUIT FOR AN AC POWER SYSTEM

Richard E. Woods, Markle, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Sept. 3, 1968, Ser. No. 756,931
Int. Cl. H02j 3/02
U.S. Cl. 307—3 16 Claims



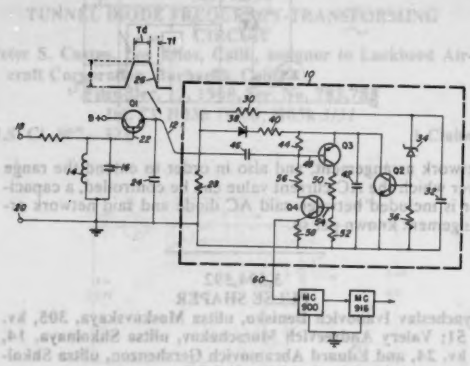
This disclosure deals with an electric system including an alternating current power supply, at least a pair of power lines adapted to connect the power supply to a load, a pulse transmitter connected across the power lines, and a pulse detector connected to the power lines. The pulse transmitter includes a potential breakdown device and a potential storage device. As the AC potential across the two power lines, which is also the potential across the transmitter, changes, the breakdown device responds to the instantaneous potential drop across the power lines and fires. Either charging or discharging current then flows through the breakdown device and the storage device, such current flow resulting in a pulse appearing on the two power lines. This pulse is picked up by the detector.

3,594,585

PULSE RECOGNITION CIRCUIT

Joseph A. Bourget, Glencoe, Md., assignor to Chesapeake Systems Corporation, Cockeysville, Mo.

Filed May 31, 1968, Ser. No. 733,405
Int. Cl. H03k 5/20
U.S. Cl. 307—234 13 Claims



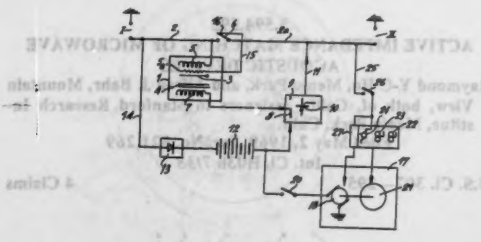
The disclosure describes a circuit capable of recognizing a succession of changes in an electrical signal and of discriminating against signals having amplitude, duration or fall times which lie outside predetermined values. The circuit requires no separate power supply, relaying on the input signal for its power supply and thus consuming no power during standby, and provides a combination of elements which is sensitive to voltage level changes appearing at discrete time intervals.

3,594,586

INSTALLATION FOR FURNISHING CURRENT WITHOUT DISCONTINUITY IN CASE OF POWER FAILURE

Rene A. M. Toesca, Boyertown, Pa., assignor to Energy Transformation Corporation, Boyertown, Pa.

Continuation of application Ser. No. 542,531, Apr. 14, 1966. This application May 23, 1969, Ser. No. 828,108
Claims priority, application France, Apr. 16, 1965, 13660
Int. Cl. H02j 9/00
U.S. Cl. 307—66 11 Claims



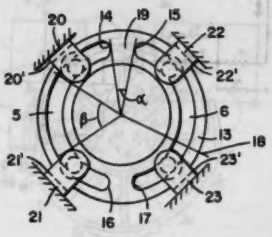
This emergency standby power system includes a battery which is constantly charged whenever the normal AC source is functioning. The battery supplies power to an inverter which is coupled to one of the output terminals and which is synchronized by induced voltages applied to the inverter input in response to the vibrations of a vibrating magnetic element. The vibrating element responds to the AC source when it is functioning and to an auxiliary winding connected to the output of the inverter when the AC source is not functioning. When the AC source is not functioning, a turbine-driven DC generator applies current to power the inverter.

3,594,587

DEVICE FOR TRANSMITTING SIGNALS BETWEEN A ROTATABLE MEMBER AND A FIXED MEMBER

Gerhard Martens, and Herbert Turk, both of Remscheid-Lennep, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Dec. 18, 1969, Ser. No. 886,087
Claims priority, application Germany, Dec. 24, 1968, P 18 16 936.3
Int. Cl. G01k 13/08
U.S. Cl. 307—149 5 Claims



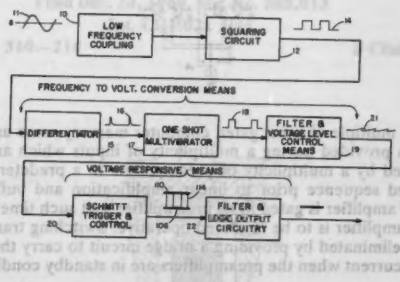
A device for the transmission of two or more signals, such as control signals, between a rotatable member such as a roller and a fixed or stationary member, e.g. as required in textile machines for the control of heated godets or rollers which convey thread on a heated surface maintained at a predetermined temperature, said device including at least two elongated arcuate signal transmitting elements carried rotatably on an annular planar support secured to the godet or roller and preferably two stationary transmitting elements for each of the rotatably carried transmitting elements wherein at least one of the stationary transmitting elements always remains in an operative coupling position with a rotatably carried transmitting element to form an individual transmitting unit for one of the signals.

3,594,588

FREQUENCY DETECTION SYSTEM

Philip C. Evans, Phoenix, and Robert J. Haver, Tempe, both of, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 1, 1969, Ser. No. 811,720
Int. Cl. H03k 5/00
U.S. Cl. 307—233 7 Claims

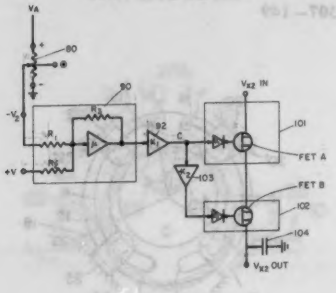


A frequency-detecting system which includes frequency-to-voltage conversion circuitry operative to convert a fixed frequency signal into a DC ripple voltage, the level of which may be varied by varying system resistance A Schmitt trigger is connected to receive the DC ripple voltage and provide in response thereto either: (1) one or the other of two fixed DC output voltages, or (2) an output pulse waveform which alternates between the two fixed DC voltage levels. An output circuit is connected to the Schmitt trigger to provide one output voltage if the Schmitt trigger output signal is an alternating voltage and another output voltage if the Schmitt trigger output signal is a fixed DC voltage.

3,594,589
SAMPLE AND HOLD CIRCUIT

Robert L. Hall, Marblehead, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 660,436, Aug. 14, 1967
Filed Mar. 23, 1970, Ser. No. 21,992
Int. Cl. H03k 5/20, 17/60
U.S. Cl. 307—235 5 Claims

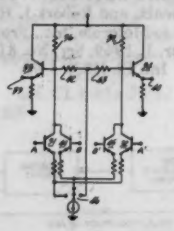


A circuit for maintaining the level of an output signal at a value which is essentially equal to the value of a periodically sampled input signal, said circuit including a pair of gates which are made simultaneously conductive over a controlled sampling time interval whereby an input signal is applied to a storage device which thereupon produces an output signal, the level of which is maintained for a particular time period at the level of the sampled input signal.

3,594,590
MEMORY SENSE AMPLIFIER

Kirk W. Smith, West Acton, Mass., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 9, 1968, Ser. No. 782,305
Int. Cl. H03k 17/60
U.S. Cl. 307—243 4 Claims



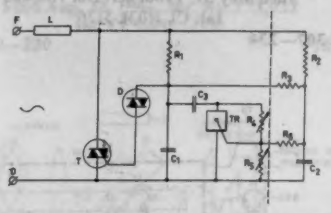
A multiple channel gated computer memory sense amplifier is provided having a multiplicity of inputs which are amplified by a multiplicity of preamplifiers in a predetermined timed sequence prior to linear amplification and buffering. The amplifier is gated in its preamplifier unit such time as the preamplifier is to be rendered operative. Switching transients are eliminated by providing a bridge circuit to carry the biasing current when the preamplifiers are in standby condition.

3,594,591
ALTERNATING CURRENT CONTROL DEVICE

Robert R. Laupman, Wijchen, Netherlands, assignor to N. V. Auco, Wijchen, Netherlands

Filed Jan. 15, 1969, Ser. No. 791,262
Claims priority, application Netherlands, Jan. 15, 1968, 6800603
Int. Cl. H03k 17/00
U.S. Cl. 307—252B 11 Claims

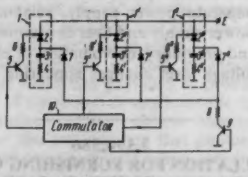
A device for controlling AC flowing through a load by means of an AC thyristor which is triggered through a trigger control network arrangement comprising an AC diode and a network arrangement known per se which functions as a bilateral transistor. In order to obtain an automatic compensation for inequalities of the transistors used in the aforesaid network arrangement, and also in order to extend the range over which the AC current value can be controlled, a capacitor is included between said AC diode and said network arrangement known per se.



3,594,592
PULSE SHAPER

Vyacheslav Ivanovich Denisko, ulitsa Moskovskaya, 305, kv. 51; Valery Andreevich Morschakov, ulitsa Shkolnaya, 14, kv. 24, and Eduard Abramovich Gershenzon, ulitsa Shkolnaya, 14, kv. 24, all of Riga, U.S.S.R.

Filed Aug. 22, 1968, Ser. No. 754,590
Int. Cl. H03k 5/00
U.S. Cl. 307—260 4 Claims

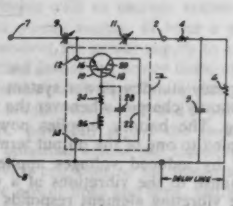


A pulse shaper for shaping pulses which are time-lagged with respect to each other, including a plurality of shaper circuits, each of the shaper circuits being provided with a charging and a discharging circuit, and a control circuit for alternately energizing the charging and discharging circuit of each shaper and for energizing each of the shapers successively. The discharging circuit of each shaper is connected through a keyed circuit which is supplied with control signals from the control circuit.

3,594,593
ACTIVE IMPEDANCE MATCHING OF MICROWAVE ACOUSTIC DEVICES

Raymond Y-C Ho, Menlo Park, and Alfred J. Bahr, Mountain View, both of, Calif., assignors to Stanford Research Institue, Menlo Park, Calif.

Filed May 2, 1969, Ser. No. 821,269
Int. Cl. H03h 7/38
U.S. Cl. 307—295 4 Claims



The impedance of delay lines (particularly acoustic delay lines) is matched to the microwave source utilizing active networks synthesized from inverted common collector

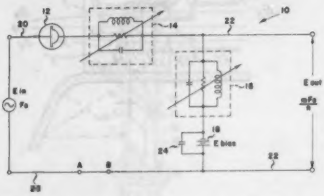
transistor circuits. The active inductance and negative resistance generated by the inverted common collector transistor circuits are connected across input terminals of the delay line and matching is improved by connecting an active negative resistance in series between source input terminal and a delay line input terminal.

3,594,594

TUNNEL DIODE FREQUENCY-TRANSFORMING CIRCUIT

Peter S. Castro, Los Altos, Calif., assignor to Lockheed Aircraft Corporation, Burbanks, Calif.

Filed Dec. 12, 1968, Ser. No. 783,785
Int. Cl. H03b *19/00*; H03k *3/31*
U.S. Cl. 307—322 1 Claim



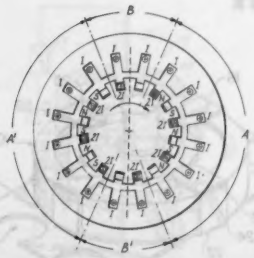
Frequency division of an RF input signal is provided by a circuit having a tunnel diode and resonant circuitry tuned to the input frequency and also tuned to a selected output frequency, which is a ratio or subharmonic of the input frequency. The tunnel diode is biased so that no oscillation and no output signal occurs in the circuit in the absence of the input signal. When an input signal is applied selected subharmonic signals extend into the negative resistance region of the tunnel diode and are sustained.

3,594,595

ALTERNATING CURRENT GENERATORS

Frederic Calland Williams, Prestbury, and Graham Wilson McLean, Stockport, both of, England, assignors to National Research Development Corporation, London, England

Continuation-in-part of application Ser. No. 670,049, Sept. 25, 1967. This application Sept. 30, 1969, Ser. No. 862,409
Int. Cl. H02k *17/42*
U.S. Cl. 310—168 11 Claims



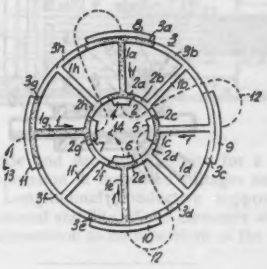
An inductor alternator the stator member of which carries a DC excitation winding and an output winding, which may be multiphase, and a rotor member carrying a short-circuited winding. The short-circuited winding may be a squirrel cage or may comprise conductor bars connected in series with each other between end rings or else may be connected to form short-circuited coils. The action of the machine is that circulating currents are generated in the rotor winding as the rotor rotates the direction of these currents reversing over pole pitches of the excitation winding and the multipole field so generated causes alternating currents to be generated in the output winding.

3,594,596

HOMOPOLAR ELECTRICAL MACHINES

John Frederick Eastham, Long Ditton, Surry, England, assignor to National Research Development Corporation, London, England

Filed Apr. 1, 1969, Ser. No. 812,203
Claims priority, application Great Britain, Apr. 9, 1968, 16983/68
Int. Cl. H02k *31/00*
U.S. Cl. 310—178 4 Claims



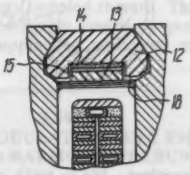
A homopolar electrical machine having a sectorially subdivided rotor wherein there are two magnetically separate current paths in each sector, which current paths are magnetically coupled to a corresponding current path of an adjacent sector at either side to reduce commutation induced voltages.

3,594,597

DEVICE FOR FIXING STATOR WINDING BARS IN THE SLOTS OF ELECTRIC MACHINES

Vasily Semenovich Kildishev, ulitsa Plekhanovskaya, 41/43, kv. 55; Boris Leonidovich Konovalov, ulitsa 12 Aprelya, 10, kv. 16; Alexandr Abramovich Chigirinsky, ulitsa Kulbysheva, 11, kv. 8; Lazar Yankelevich Stanislavsky, ulitsa Mayakovskogo, 11, kv. 24; Boris Volkovich Spivak, ulitsa Kosiora, 56, kv. 55, and Vladimir Grigorievich Rakogon, ulitsa Bairona, 146/2, kv. 19, all of Kharkov, U.S.S.R.

Filed Dec. 24, 1969, Ser. No. 888,013
Int. Cl. H02k *3/48*
U.S. Cl. 310—214 8 Claims



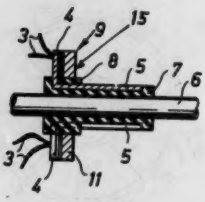
A device for fixing stator winding bars in the slots of electrical machines, comprises a wedge constituted of two portions of which one is placed into a longitudinal groove in the other portion; an elastic member is provide between the wedge portions to create an interference between the wedge and the bar, the elastic member being adapted, while in operation, to press one of the wedge portions against the winding bar.

3,594,598

SPARK-SUPPRESSING COMMUTATOR ARRANGEMENT FOR ELECTRIC MOTOR

Gerhard Schaub, Nurnberg, Germany, assignor to Gebr, Buhler NACHF. GmbH, Nurnberg, Germany

Filed Oct. 6, 1969, Ser. No. 863,842
Claims priority, application Germany, Oct. 23, 1968, G 68 03 418
Int. Cl. H02k 13/10
U.S. Cl. 310—220 8 Claims



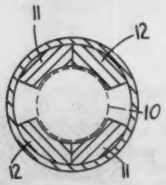
An electric motor with quenching capacitors, particularly a miniature motor of this type, has a carrier ring supporting the capacitors and seated on the rotor shaft concentric therewith. The ring is secured to soldering flags which also connect the capacitors with the commutator segments of the rotor whereby all the capacitors can be assembled as a structural unit on the rotor without causing imbalances and can also be conveniently connected to the commutator segments of the rotor.

3,594,599

DIRECT CURRENT DYNAMOELECTRIC MACHINES

John Godfrey Wilson West, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 4, 1969, Ser. No. 847,249
Claims priority, application Great Britain, Aug. 16, 1968, 39,324/68
Int. Cl. H02k 1/12
U.S. Cl. 310—258 5 Claims



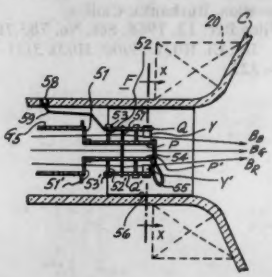
A direct current dynamoelectric machine has poles in the usual way, but each pole has a first portion formed from steel and a second portion formed from ferrite material. The steel has a lower reluctance than the ferrite material, but in use the flux density is increased by armature reaction in the vicinity of the steel portion, and reduced by armature reaction in the vicinity of the ferrite portion, so that the required characteristics of the machine are obtained with a saving in material. The same effect, utilizing the armature reaction to increase flux density beneath a pole part which has a lower reluctance than the other part of the pole, can be achieved in other ways.

3,594,600

CONVERGENCE MEANS FOR A PLURAL BEAM COLOR PICTURE TUBE

Hiroshi Murata; Akiyoshi Inose; Masahide Sawai, and Yuzo Fuse, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1969, Ser. No. 888,338
Claims priority, application Japan, Dec. 30, 1968, 43/96500
Int. Cl. H01j 29/50, 29/76
U.S. Cl. 313—79 7 Claims



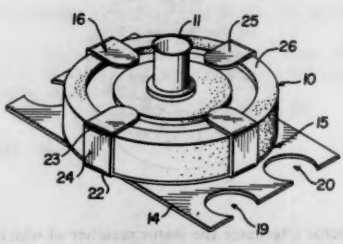
In a color cathode-ray tube of the plural-beam type wherein the beams originate on a horizontal or vertical straight line and are directed into fields produced by a horizontal-vertical electromagnetic deflection yoke at predetermined incident angles to each other so as to converge at a color screen, magnetic shielding means, for example, secured to electron beam convergence plates, are disposed for selectively shielding at least one of the beams from the leakage flux produced by the horizontal-vertical electromagnetic deflecting yoke in deflecting the beams in the direction of the line of origination thereof, whereby such leakage flux acts selectively on only the unshielded beam or beams for correcting a deviation between the positions of rasters on the color screen produced by the plural beams.

3,594,601

HOLDER AND MOUNTING MEANS FOR CERAMIC CRT CATHODE RING

Horst H. Blumenberg, Owensboro, Ky., assignor to Kentucky Electronics Corporation, Owensboro, Ky.

Filed Jan. 28, 1970, Ser. No. 6,398
Int. Cl. H01j 1/94, 29/02
U.S. Cl. 313—82 R 9 Claims



An electron gun for a cathode-ray tube has a cathode centrally mounted in a ceramic ring. The ring has a metal holder comprising a flat plate with means extending about the periphery of the ring and forming a clamp against the other side. The cathode assembly is held in the electron gun assembly by embedding the edges of a flat plate extending from the ring into a pair of glass beads. The cathode is critically spaced from a grid comprising a flat apertured plate by having edges of the plate embedded in the same glass beads.

3,594,602

DISPLAY DEVICE INCLUDING RESILIENT MOUNTING MEANS

Norman Lee Lindburg, Berkeley Heights, N.J., assignor to RCA Corporation

Filed May 13, 1969, Ser. No. 824,057
Int. Cl. H01j 61/66
U.S. Cl. 313—109.5 9 Claims

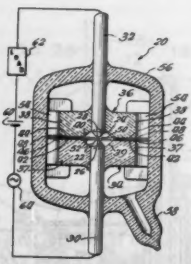
A display device comprises an envelope having a stem including leads therethrough. Mounted on the leads within the envelope is a rigid substrate having a plurality of light sources thereon. To prevent movement of the substrate relative to the envelope, leaf springs are provided rigidly affixed to the substrate and in spring-flexed engagement with the inside wall of the envelope.

3,594,603

FIELD EMISSION CIRCUIT ELEMENT AND CIRCUIT

Walter P. Guckenburg, Linthicum, Md., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 29, 1968, Ser. No. 724,845
Int. Cl. H01j 25/74; H04b 1/04
U.S. Cl. 313—214 12 Claims



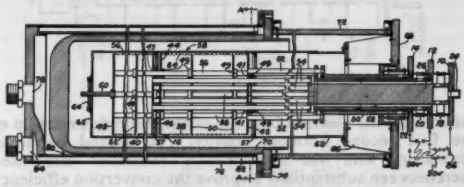
A field emission circuit element adaptable for use at the millimeter wave range of the frequency spectrum. The field emission element may take the form of a diode embodiment including a pair of electrodes presenting opposing emitter and collector surfaces bounding a vacuum gap having a configuration defining a regular field region terminating at the surfaces. The circuit element is characterized by minute gaps and high vacuums whereby the regular field region is capable in the presence of applied electric potential of providing an electric field for producing at the emitter surface electron field emission controllable at the millimeter wave range.

3,594,604

HIGH-POWER ELECTRON TUBE HAVING TWO LONGITUDINALLY DISPLACED CATHODE SECTIONS

Joseph J. Tritchler, Bethlehem, and Paul Merrick, Easton, both of, Pa., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 17, 1968, Ser. No. 730,140
Int. Cl. H01j 1/94, 19/48
U.S. Cl. 313—278 10 Claims



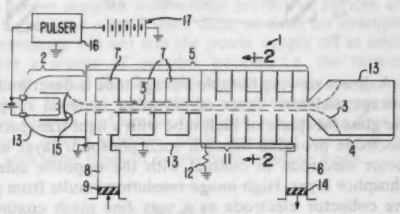
A split cathode and support structure for a high-power triode permit operation at increased voltages and relatively low currents. Longitudinal conductive support members maintain dimensional stability of the elements while providing a common connection to both portions of the cathode.

3,594,605

MODE SUPPRESSION MEANS FOR A CLOVER-LEAF SLOW WAVE CIRCUIT

Charles E. Blinn, Sunnyvale, CA, assignor to Varian Associates, Palo Alto, Calif.

Filed Oct. 31, 1969, Ser. No. 872,887
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 6 Claims



A microwave velocity modulation electron tube employing a cloverleaf slow wave structure has a mode suppression cavity resonator provided in the conductive nose portions of the slow wave circuit. The mode suppression cavities are coupled through a pair of elongated coupling slots provided in the sidewalls of the noses. The mode suppression cavities are coated with a lossy wave energy attenuating material for absorbing wave energy coupled thereto. The mode suppression cavities are capacitively loaded by post structures and stagger tuned for suppressing undesired modes of oscillations.

3,594,606

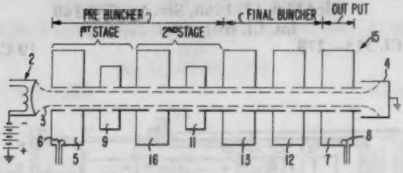
VELOCITY MODULATION TUBE EMPLOYING CASCADED HARMONIC PREBUNCHING

Erling L. Lien, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 15, 1970, Ser. No. 28,791
Int. Cl. H01j 25/12
U.S. Cl. 315—5.43 7 Claims

A velocity modulation microwave tube is disclosed. The tube includes an input circuit, an output circuit and a penultimate resonator circuit disposed along the beam. A pair of second harmonic floating prebuncher resonators are disposed along the beam path intermediate the input circuit and the penultimate resonator. The second harmonic resonators improve the bunching of the beam by moving electrons from

the interbunch region of the beam into the bunched region of the beam. A resonator tuned for a fundamental mode of resonance at the fundamental frequency of the tube is interposed between the pair of second harmonic resonators for



rebunching the electron bunches of the beam downstream of the first second harmonic cavity. The second harmonic resonators with the fundamental resonator interposed therebetween substantially improve the conversion efficiency of the microwave tube.

3,594,607

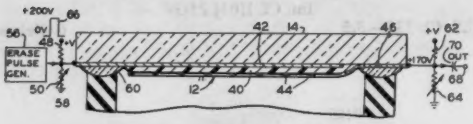
DIRECT VIEWING BISTABLE STORAGE TUBE HAVING FAST ERASE SPEED

Roger A. Frankland, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of application Ser. No. 816,576, Apr. 16, 1969. This application Apr. 10, 1970, Ser. No. 27,383

Int. Cl. H01j *29/31*

U.S. Cl. 315—12 **15 Claims**



A direct viewing bistable storage tube is described having a storage dielectric layer of phosphor material supported on the glass faceplate of such tube with a light transparent target electrode provided beneath such phosphor layer and a collector electrode in contact with the opposite side of such phosphor layer. High image resolution results from providing the collector electrode as a very fine mesh coating on the phosphor layer. The target electrode may be used as an erase electrode and because it is separate from the collector electrode the tube is provided with a faster erase speed, of about 1 to 50 milliseconds. Thus, the voltage on the collector electrode can be set for optimum secondary electron collection during erasure, as well as during storage, while the voltage of the erase electrode can be varied to provide an erase pulse of the proper amplitude and time for optimum erasure. The erase electrode can be split into a plurality of insulated conductive areas to provide independent operation of different portions of the storage dielectric in a storage or nonstorage mode. An intermediate layer of light transparent insulating material, such as silicon dioxide, may be provided between the target electrode and the phosphor layer to increase the voltage breakdown strength of the dielectric.

3,594,608

ELECTRON BEAM DISPLAY SYSTEM HAVING LIGHT DETECTOR PEN WITH ASSOCIATED SAMPLING AND MEMORY CIRCUITS

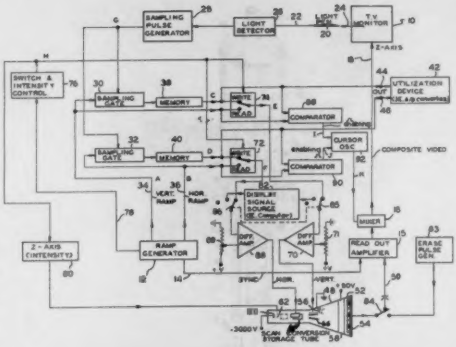
Jon C. Mutton, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 12, 1969, Ser. No. 823,898

Int. Cl. H01j *29/74*

U.S. Cl. 315—24 **14 Claims**

A cathode-ray tube display system is described in which a light pen is employed to indicate the position of and to write on a selected portion of a display on a television monitor by detecting the light trace of the electron beam as it is deflected by the raster signal past such pen at the selected display portion. The system employs a sampling gate and an analog memory circuit for sampling horizontal and vertical ramp signals synchronized with the raster signal when a trigger signal is produced by the light detector, and for storing horizontal and vertical sample voltage levels corresponding to the position of the light pen. These sample voltages are



employed to write a light pen spot on the display during the retrace time of the horizontal raster signal, either by generating a cursor signal which is applied directly to the TV monitor or by applying such sample voltages to the deflection circuits of a scan conversion storage tube. Charge images of the display and the pen spot are written on the storage tube and stored so that during reading such tube supplies an electrical readout signal corresponding to such charge images to the TV monitor.

3,594,609

PLASMA GENERATOR WITH MAGNETIC FOCUSSING AND WITH ADDITIONAL ADMISSION OF GAS

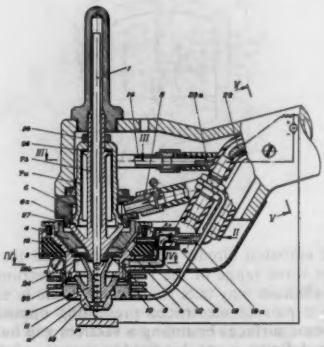
Alexandru Vas, Timisoara, Romania, assignor to Ministerul Industriei Constructiilor De Masini Calea Victoriei, Bucharest, Romania

Filed Apr. 16, 1968, Ser. No. 721,843

Claims priority, application Romania, Apr. 17, 1967, 53571

Int. Cl. H05b *31/28*

U.S. Cl. 315—111 **3 Claims**



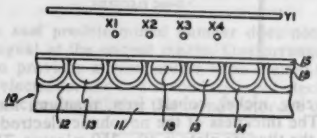
This invention relates to a plasma arc generator, operating with a DC or AC supply and having improved characteristics by virtue of arrangements for rotating the arc and the injected gas, which may be air or nitrogen for example. The

plasma arc generator, is suitable for cutting, welding, built-up welding, (i.e. welding, in which a deposit of metals is built-up), metallizing and promoting chemical reactions.

3,594,610
DISPLAY PANEL WITH CORONA DISCHARGE CONTROL

Paul F. Evans, Pittsford; Harold D. Lees, Rochester, and Martin S. Maltz, Fairport, all of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Apr. 14, 1969, Ser. No. 815,569
Int. Cl. H01j *1/62;* **H05b** *43/00*
U.S. Cl. 315—169 **9 Claims**

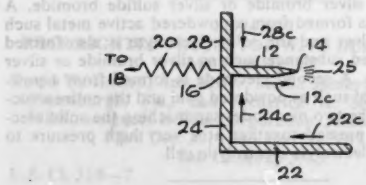


An electroluminescent display panel having solid state storage layers, an excitation current source and an ion generating source. When excitation current is applied to the panel luminescence is induced. A corona discharge created by addressing a matrix of conductors with a coincident voltage injects ions into the semiconductor control layer of the panel and alters the impedance state thereof. The change in the impedance state of the control layer alters the current flow through the panel resulting in a corresponding change in the state of panel luminescence. By selectively writing into an addressed matrix element either sequentially or simultaneously a pattern or image is formed on the panel face. The panel may be selectively erased by the addressing voltage source or by a separate erasing voltage source.

3,594,611
NOISE-FREE STATIC DISCHARGER

Robert L. Tanner, and Robert Michael Tanner, both of Palo Alto, Calif., assignors to Technology for Communications International, Mountain View, Calif.

Filed Oct. 9, 1968, Ser. No. 766,113
Int. Cl. B64d *45/02*
U.S. Cl. 317—2 E **12 Claims**

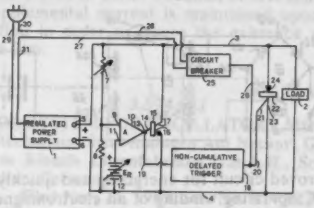


A noise-free static discharger including a conductive structure connected to a body in which static voltage builds up, by a high resistance element to provide DC connection therebetween is disclosed. The conductive structure includes at least one discharge pin with a sharp discharge point, to which are connected one or more conductive members which provide paths for the flow of RF currents, inducted therein by corona discharges, taking place at the sharp discharge point. These conductors have lengths and spatial orientations such that the RF currents induced in them create a sum of dipole moments which cancels the dipole moments of the currents in the corona discharge and in the discharge pin. The conductive members, which have blunted or rounded free tips, are preferably covered with insulating material to limit all static discharging to occur at the sharp point of the discharge pin.

3,594,612
OVERVOLTAGE PROTECTOR FOR THE LOAD OF FAST-SLEWING REGULATED POWER SUPPLIES

Joseph R. Gately, Woodside, N.Y., assignor to Forbro Design Corp., New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,510
Int. Cl. H02h *3/20*
U.S. Cl. 317—16 **6 Claims**



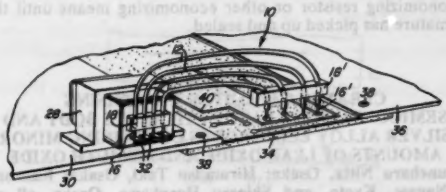
Fast-slewing regulated power supplies exhibit very short duration transient overvoltage conditions. These overvoltage spikes are attenuated when above a predetermined level. Overvoltage conditions of longer duration activate further clamping means and means for turning off the power supply.

Regulated power supplies are designed to supply predetermined voltage or current to a load. Highly regulated, stable power supplies are available. During normal steady-state operation the regulated voltage or current remains constant and no problems exist. Many loads for which such power supplies are used are extremely sensitive to overvoltage conditions, even those of extremely short duration. Power supplies having large capacitors across the output terminals tend to absorb short duration overvoltage tendencies or "spikes." For such power supplies overvoltage protective devices are designed to respond after a short delay so that, for example, turn-on transients will not trip the power supply off at once. This leaves a source of possible trouble, i.e. the turn-on transient unprovided for. In addition, fast-slewing rate power supplies have little or no capacity across their output terminals and turn-on and similar transients are greater than in conventional power supplies. Such transients may not be tolerable with some types of overvoltage sensitive loads.

3,594,613
TRANSFORMER CONNECTION

Joseph A. Prietula, Rensselaer, Ind., assignor to Woodward-Schumacher Electric Corporation

Filed Apr. 15, 1969, Ser. No. 816,357
Int. Cl. H02b *1/04;* **H01f** *27/04*
U.S. Cl. 317—101 **4 Claims**

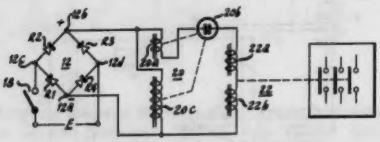


A plurality of electrical leads retained in spaced parallel relation and passing through apertured guide blocks disposed at both ends of the leads. The conductor portions of the leads extend through the apertures for connection at one end to terminal lugs on a transformer housing. The opposite ends of the leads are stripped to permit the connection thereof to a circuit board.

3,594,614
ENERGIZING CIRCUIT FOR THE DC OPERATING WINDING OF AN ELECTROMAGNETIC CONTACTOR OR THE LIKE

Werner B. Halbeck, Cedarburg, and John A. Quaal, Milwaukee, both of, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 26, 1970, Ser. No. 14,445
Int. Cl. H01h 47/02
U.S. Cl. 317—123 5 Claims

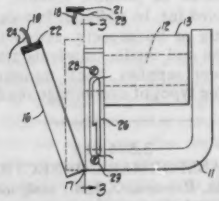


An improved circuit for energizing and quickly deenergizing the DC operating winding of an electromagnetic contactor from sources of AC supply having a wide range of frequencies. It employs a full wave rectifier bridge, an auxiliary electromagnetic switch having a pair of low-inductance operating windings and normally open contacts. One of the auxiliary switch windings of high resistance is connected across the DC output terminals of the rectifier bridge while the other thereof of low resistance is connected across the same terminal in series with the normally open contacts and the operating winding of the electromagnetic contactor.

3,594,615
DIRECT-CURRENT MAGNET WITH ECONOMIZING REED CONTACT

John A. Cortelli, Old Mill Road P. O. Box 22, Gates Mills, Ohio

Filed Apr. 2, 1970, Ser. No. 25,170
Int. Cl. H01h 47/04
U.S. Cl. 317—154 7 Claims



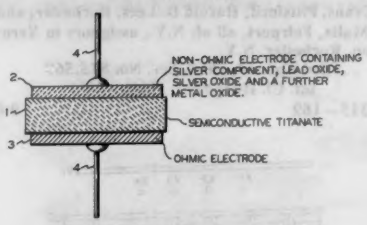
In a contactor or other movable armature device a direct current magnet with an iron core is employed. Economizing means are provided. For instance, an economizer resistor is connected in series with the magnet winding and a reed switch, subject to magnet flux before the armature has picked up and sealed, is connected to shunt out the economizing resistor or other economizing means until the armature has picked up and sealed.

3,594,616
CERAMIC CAPACITOR COMPRISING SEMICONDUCTIVE BARIUM TITANATE BODY AND SILVER ALLOY ELECTRODES CONTAINING MINOR AMOUNTS OF LEAD OXIDE AND BISMUTH OXIDE

Tsuneharu Nitta, Osaka; Hiromitsu Taki, Osaka; Kaneomi Nagase, Kyoto, and Shigeru Hayakawa, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed June 5, 1969, Ser. No. 830,607
Claims priority, application Japan, June 19, 1968, June 20, 1968, Sept. 25, 1968, Oct. 8, 1968, 43/43044;43/43207;43/70654;43/74056
Int. Cl. H01g 9/04; H01l 3/08
U.S. Cl. 317—230 12 Claims

A ceramic voltage dependent resistor made up of a semiconductive titanate (e.g. barium titanate) plate having a nonohmic electrode on one surface thereof and an ohmic electrode on the other surface. The nonohmic electrode consists essentially of 93—55 percent by weight of silver component, 6.5—25 percent by weight of lead oxide and bismuth oxide and 0.5—38.5 percent by weight of at least one metal oxide selected from the group consisting of boron, copper,

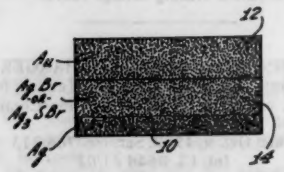

NON-OHMIC ELECTRODE CONTAINING SILVER COMPONENT, LEAD OXIDE, SILVER OXIDE AND A FURTHER METAL OXIDE.
SEMICONDUCTIVE TITANATE
OHMIC ELECTRODE

cadmium, zinc, nickel, cobalt, iron, titanium, niobium and tantalum. The thickness of the nonohmic electrode after firing it onto the titanate plate is 40—250 microns. The titanate plate comprises barium titanate of a means grain size of 5 to 50 microns and has an electrical resistivity less than 10 ohm-cm. Such voltage dependent resistors are suitable for use in varistors.

3,594,617
SOLID ELECTROLYTE ELECTROLYTIC CELL INDURING SILVER BROMIDE THEREIN

John H. Kennedy, Santa Barbara, Calif., assignor to The Bissett-Berman Corporation, Santa Monica, Calif.

Filed Aug. 25, 1969, Ser. No. 852,572
Int. Cl. H01g 9/00
U.S. Cl. 317—230 6 Claims



An electrolytic cell using a solid electrolyte such as polycrystalline silver bromide or silver sulfide bromide. A first electrode is formed from a powdered active metal such as powdered silver and the solid electrolyte is also formed from a powdered substance such as silver bromide or silver sulfide bromide. A second electrode is formed from a powdered inert metal such as powdered gold and the entire structure including the two electrodes sandwiching the solid electrolyte is then pressed together at a very high pressure to form the solid electrolyte electrolytic cell.

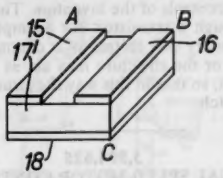
3,594,618
ELECTRONIC LOGIC ELEMENT

Hans Ludwig Hartnagel, Sheffield, England, assignor to National Research Development Corporation, London, England

Filed June 21, 1968, Ser. No. 738,880
Claims priority, application Great Britain, June 22, 1967, Nov. 30, 1967, 28933/67; 54527/67
Int. Cl. H01l 9/00
U.S. Cl. 317—234 R 18 Claims

A logic element is described utilizing a travelling field domain phenomenon, such as the Gunn effect, which occurs in a body of material when a field is produced in the body above a first threshold value to nucleate a domain and is maintained above a second threshold value to sustain the domain. A plurality of contact means are carried on the body together with output means for detecting a field domain in the body and for deriving an output signal therefrom, and the

arrangement is such that application between a predetermined number of the contact means of a potential just sufficient to create a field domain in the body produces an output signal at the output means, but the application of the same potential between a number of the contact means greater



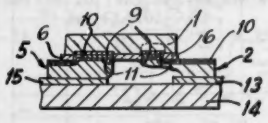
than the said predetermined number does not produce an output signal at the output means. One arrangement of the invention provides a comparator logic element having one primary electrode, and two secondary input electrodes, and a number of circuits utilizing this comparator are described.

3,594,619

FACE-BONDED SEMICONDUCTOR DEVICE HAVING IMPROVED HEAT DISSIPATION

Mototaka Kamoshida, and Takashi Okada, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 25, 1968, Ser. No. 762,490
Claims priority, application Japan, Sept. 30, 1967, 42/62975
Int. Cl. H011 *1/12, 1/14*
U.S. Cl. 317—234 2 Claims



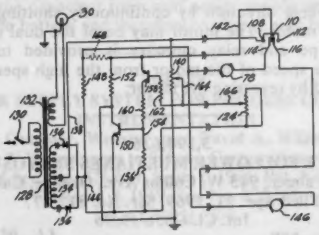
A semiconductor device is described of the face bond type wherein beam leads in electrical contact with a semiconductor circuit located in a semiconductor pellet with a pellet region located between the circuit and an edge of the pellet outwardly project in cantilever fashion from the pellet edge. Special heat-conducting contacts are formed in between the beam leads in the pellet region to provide an improved heat-dissipating device.

3,594,620

REAR LIGHTED PROJECTOR WITH DUAL ELECTRIC MOTOR DRIVE

David W. Husted, Ann Arbor, Mich.; James A. Holbrook, St. Petersburgh, Fla., and Frederick K. Soll, Ann Arbor, Mich., assignors to Baia Corporation, Jackson, Mich.

Filed Dec. 30, 1968, Ser. No. 787,795
Int. Cl. H02p *5/46*
U.S. Cl. 318—7 7 Claims



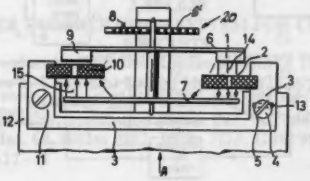
The invention pertains to viewing apparatus for motion-picture film and particularly concerns rear- or back-lighted motion-picture viewing devices of the type commonly known as viewers, editors, and the like, and may include microreaders and other film magnifying and projecting apparatus wherein the film image is projected upon the rear surface of a translucent screen. The projecting and viewing apparatus includes a substantially horizontal deck upon which film reels are supported and the projector includes a front screen panel receiving the projected image. The film spindles are individually powered by electric motors associated with speed reduction gear trains, and the motor control circuit connects the motors in series such that both motors will be driven in either direction of reel spindle rotation and a supplemental current is maintained upon the motor winding film in order to insure the existence of a tension within the film.

3,594,621

CONTROL SYSTEM FOR OSCILLATORY MOVEMENTS

Helmut Stechmann, Schwenningen Am Neckar, Germany, assignor to Kienzle Uhrenfabriken G.m.b.H., Schwenningen am Neckar, Germany

Filed Nov. 24, 1969, Ser. No. 879,023
Claims priority, application Germany, Nov. 23, 1968, P 18 10 523.2
Int. Cl. H02k *33/02*
U.S. Cl. 318—128 8 Claims



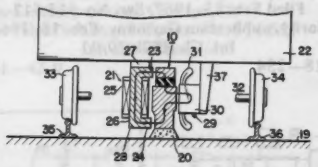
The invention concerns a device for adjusting or controlling the oscillation amplitude of a directly driven mechanical oscillating system which is equipped with at least one permanent magnet, which performs oscillations over a control coil, producing therein an induction voltage, which effects over an electronic circuit flow in an operating coil whose magnetic field has a drive effect on the oscillating system, the electronic circuit as a control circuit regulating the current flow in dependence on the induced voltage, so that the oscillation amplitude remains constant.

3,594,622

LINEAR COMB-SHAPED SYNCHRONOUS MOTOR

Junpei Inagaki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Feb. 24, 1970, Ser. No. 13,733
Claims priority, application Japan, Feb. 24, 1969, 44/13165
Int. Cl. H02k *41/02*
U.S. Cl. 318—135 13 Claims



In a linear comb-shaped synchronous motor, there is provided a linear comb-shaped reaction rail which includes a pair of elongated linear comb-shaped members, each of which also comprises an elongated yoke made of magnetic material and a plurality of poles similarly made of magnetic material integrally mounted on the yoke such that they and are respectively positioned on the yoke apart from each other with a predetermined interval are placed.

There is also provided DC exciting means having core the legs of which are respectively directed to the yokes in order to supply the DC excitation for the poles. All the poles integral with one of the comb-shaped members are excited to make the north poles, and on the other hand, all of the poles integral with the other of the comb-shaped members are similarly excited to make the south poles.

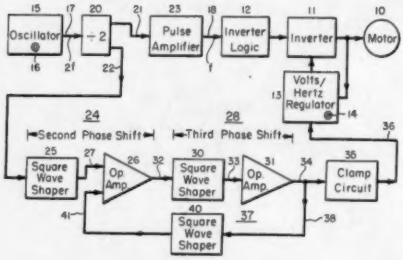
There is also provided an armature having an armature winding and positioned opposite the functional surface of the pole surfaces. The armature winding is energized from an AC power supply in such a manner that the directions of the armature currents are varied each time the armature passes through the alternately magnetized poles.

3,594,623

AC MOTOR CONTROL SYSTEM WITH ANTICOGGING CIRCUIT

Donald M. Lamaster, Tustin, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 13, 1970, Ser. No. 19,170
Int. Cl. H02p *3/40*
U.S. Cl. 318—227 **8 Claims**



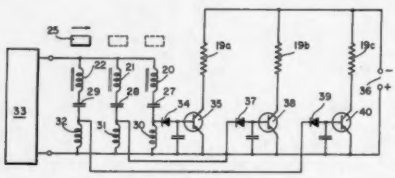
A motor control system including conventional components such as a volts/Hertz regulator to modify the inverter voltage amplitude, a logic stage to regulate inverter voltage frequency, and an oscillator for supplying timing pulses for the logic stage. To compensate undesired "cogging" at low operating frequencies, a square wave signal is produced and then integrated. An additional circuit is provided to incorporate additional phase shift in the signal which modulates the voltage passed from the inverter to the motor to prevent cogging. As the frequency of system operation increases, integration of the correction signal provides a modulating signal of decreasing amplitude. Thus the anticogging circuit is only effective at the lower end of the system operating range.

3,594,624

ELECTRICAL MOTOR CONTROLS INCLUDING NON-LINEAR SERIES RESONANT CIRCUITS

Ernst Lueder, Stuttgart sur, Germany, assignor to Firma Gebr. Buhler Nachfolger G.m.b.H., Kornerstrasse, Nurnberg, Germany

Filed Feb. 13, 1967, Ser. No. 615,517
Claims priority, application Germany, Feb. 15, 1966, L52862
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **1 Claim**



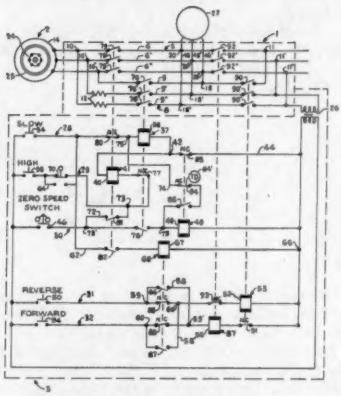
Electrical controls which include a resonance circuit connected electrically to an oscillator and having a plurality of circuit elements to one of which an output means is connected in parallel. A regulating means coacts with one of the circuit elements for influencing at least one of the parameters of the circuit. For example, the circuit may include an inductance coil and the regulating means may take the form of a permanent magnet which is moved in a predetermined manner with respect to the inductance coil so as to achieve in this way the controls of the invention. The output means is connected through a transistor, for example, to an element such as a stationary coil section of a commutator-less direct current motor, or the structure may act as a switch for controlling a circuit, so that in this way the structure will form an incorporeal switch.

3,594,625

DUAL SPEED MOTOR CONTROL

Raymond H. Richardson, Chicago, Ill., assignor to Interlake Steel Corporation

Filed Aug. 29, 1969, Ser. No. 854,217
Int. Cl. H02p *7/54*
U.S. Cl. 318—257 **10 Claims**



A motor control circuit for operating a motor at a high speed and a substantially slower speed than the high speed which includes a plurality of relay operated switches which are selectively operated to operate the motor either in the fast forward or reverse directions or in the slow forward or reverse directions. A zero speed switch acts in conjunction with a time delay switch to operate the motor in the slow forward or reverse direction by continuously shutting off and starting the motor. The motor may be of the dual rotor AC induction-type and relay circuitry is provided to rapidly decrease the speed of the motor from the high speed to the slower speed by reversing the motor.

3,594,626

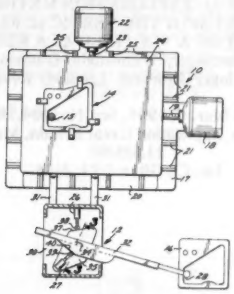
TEMPLATE FOLLOWER MULTIAXES SERVOSYSTEM

Charles G. Palmer, 945 W. Collins Ave., Orange, Calif.

Filed Apr. 21, 1969, Ser. No. 817,877
Int. Cl. G05b *19/36*
U.S. Cl. 318—578 **4 Claims**

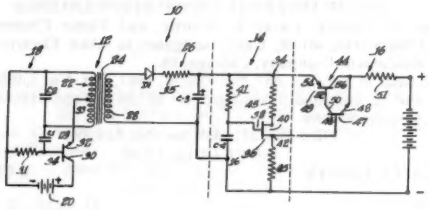
This invention relates to improvements in servosystems, particularly position servosystems. The specification discloses, and the drawing depicts, a two axis positioning system

having an analog input structure and a digital positioner. Novel electric circuitry is disclosed by which the analog input



information is conditioned for application to the digital positioner. Two forms of manually operable input structures are shown.

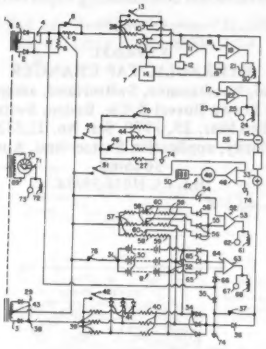
3,594,627
CAPACITOR DISCHARGE BATTERY CHARGER
John C. Lesher, Erie, Pa., assignor to Teledyne, Inc., Los Angeles, Calif.
Filed Oct. 20, 1969, Ser. No. 867,679
Int. Cl. H02j *7/02*
U.S. Cl. 320—21 **11 Claims**



A capacitor discharge charger for charging a battery comprising: a capacitor electrically connected intermediate a source of power and the battery to be charged, a source of power for charging the capacitor, and means for alternately charging the capacitor from said power source and discharging it to the battery and therefore to charge said battery.

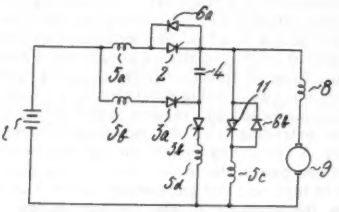
3,594,628
POWER SUPPLY SYSTEM FOR PROCESS CONTROL INSTRUMENTATION
Alfred N. Gutzmer, Webster, and David A. Willett, Penfield, both of, N.Y., assignors to Sybron Corporation
Division of Ser. No. 576,629, Sept. 1, 1966, Pat. No. 3,483,393.
Filed Oct. 8, 1969, Ser. No. 871,166
Int. Cl. H02j *7/00*
U.S. Cl. 320—13 **2 Claims**

A power supply system for process control instrumentation includes a regulator providing regulated DC from an AC source and has an emergency battery supply operative upon failure of the AC source. Indicating means in the form of an overdischarge indicator and an under voltage indicator in the



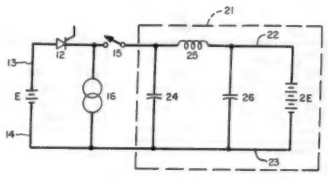
form of a "lowest of" selector are provided. For a full disclosure of the invention, reference should be made to the body of the disclosure.

3,594,629
POWER REGENERATION SYSTEM FOR CHOPPER CIRCUITS
Chuji Kawakami, and Ichiro Kouzuma, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan
Filed Dec. 2, 1969, Ser. No. 881,517
Claims priority, application Japan, Dec. 9, 1968, 43/90438
Int. Cl. H02m *3/32;* **H02p** *7/28;* **G05f** *1/00*
U.S. Cl. 321—2 **5 Claims**



The conventional use of an electromechanical switching device in a DC–DC chopping circuit is avoided by a chopper circuit including a main switching device and first and second auxiliary switching devices for controlling the main switching device and for providing charging and discharging paths for the commutation capacitor.

3,594,630
COMMUTATION CIRCUIT FOR SCR'S
George H. Studtmann, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Nov. 6, 1969, Ser. No. 874,553
Int. Cl. H02m *7/48*
U.S. Cl. 321—45 R **10 Claims**



An inverter circuit includes a pair of conventional commutating capacitors, coupled in series between the input con-

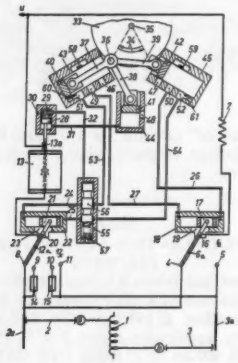
ductors. Additional pair of commutating capacitors is provided, and an inductor is coupled between the common connection of the additional capacitors and the common connection of the conventional commutating capacitors.

3,594,631

HYDRAULIC TAP CHANGER

Heinz Trachsel, Nussbaumen, Switzerland, assignor to Aktiengeselischaft Brown Boveri & Cie, Baden, Switzerland

Filed Mar. 25, 1970, Ser. No. 22,532
Claims priority, application Switzerland, Apr. 2, 1969, 5046/69
Int. Cl. H01f *29/04*
U.S. Cl. 323—43.5 R **5 Claims**



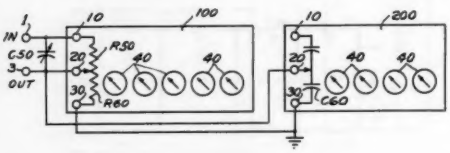
A step-switching arrangement for changing the taps on a transformer winding without interrupting the flow of current from the winding to a load line includes a precontact switch and a current-limiting resistance connected in a series circuit extending from the transformer tap changing contacts to the load line, this circuit being paralleled by a circuit containing a changeover switch and vacuum switch connected in series and also extending from the tap-changing contacts to the load line. A circulating current through the switches and resistance and part of the transformer winding occurs during a change in taps, and this circulating current is interrupted by opening the contacts of the vacuum switch. All of the switches are actuated by hydraulic motors of the linear type, the motors being supplied from hydraulic pumps of the linear type which are operated in synchronism with the tap-changing mechanism so as to obtain the necessary operating sequence for the various switches in changing over from one tap to another.

3,594,632

ADJUSTABLE ATTENUATORS AND FILTER APPARATUS

Paul P. Luger, 801 Tenth Ave., Seattle, Wash.

Continuation-in-part of application Ser. No. 562,996, , now Patent No. 3,541,430. This application Mar. 13, 1970, Ser. No. 19,303
Int. Cl. G05f *3/00*
U.S. Cl. 323—74 **9 Claims**



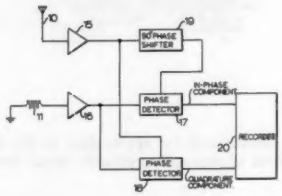
Three types of potentiometer circuits, resistive, capacitive and inductive are employed in overall adjustable attenuator systems. Each element in a switching network is either a single-terminal element or a double-terminal element and minimum contact between networks follow a switch rule principle.

3,594,633

GEOPHYSICAL EXPLORATION METHOD AND APPARATUS USING THE VERTICAL ELECTRIC COMPONENT OF A VLF FIELD AS A REFERENCE

Anthony Rene Barringer, Willowdale, Ontario, Canada, assignor to Barringer Research Limited, Rexdale, Ontario, Canada

Filed Mar. 6, 1969, Ser. No. 804,780
Claims priority, application Great Britain, Mar. 9, 1968, 11,625/68
Int. Cl. G01v *3/12, 3/16*
U.S. Cl. 324—6 **10 Claims**



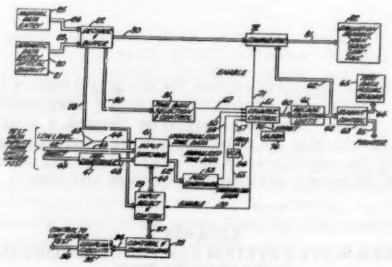
A geophysical exploration method and apparatus utilizing VLF fields produced by distant transmitters as a source of primary field. The vertical electric alternating field component of the primary field is used as a stable reference against which variations in magnetic alternating field components caused by inhomogeneities in earth conductivity can be measured.

3,594,634

METHOD AND APPARATUS FOR MEASURING DWELL TIME IN INTERNAL COMBUSTION ENGINES

Don M. Muller; Lavar E. Whittle, and Victor Chartrand, Chatsworth, all of, Calif., assignors to Allen Electric and Equipment Company, Chicago, Ill.

Division of Ser. No. 687,390, Dec. 1, 1967, Pat. No. 3,485,093, and a continuation-in-part of 487,861, Sept. 16, 1965, now abandoned.
Filed Jan. 21, 1969, Ser. No. 810,890
Int. Cl. G01m *15/00*
U.S. Cl. 324—16 **6 Claims**

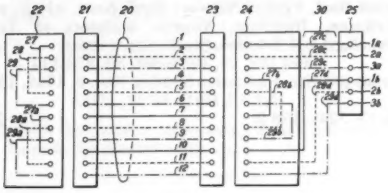


A method and apparatus for analyzing the ignition system of an internal combustion engine, or similar system whereby the analysis is not affected by the speed of the engine. The apparatus includes a means for obtaining a digital signal indicative of the speed of the engine and a second means for generating a pulse in response to distributor point operating and then a means for counting the speed signal pulses during the duration of the distributor point pulses.

3,594,635
MULTICONDUCTOR-ELECTRIC-CABLE TESTING DEVICE HAVING TWO CONNECTION ADAPTERS FOR DIVIDING THE CABLE CONDUCTORS INTO A PLURALITY OF GROUPS OF SERIES-CONNECTED CONDUCTORS

Mitsuo Minamii, Yokohama-shi; Kimiyishi Sasaki, Sagamihara-shi, and Takashi Saito, Hatano-shi, all of, Japan, assignors to Stanley Denki Kabushiki Kaisha (a/k/a Stanley Electric Co., Ltd.), Tokyo-to, Japan

Filed Jan. 5, 1970, Ser. No. 772
Claims priority, application Japan, May 13, 1969, 44/36317
Int. Cl. G01r 31/02
U.S. Cl. 324—51 4 Claims

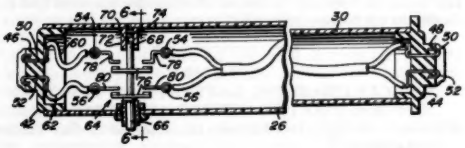


An automatic testing device for a multiconductor electric cable two ends of which are respectively connected to two connectors, where conductors of the multiconductor electric cable are divided into a plurality of groups of series-connected conductors by connecting respectively two connection adapters to said two connectors. Respective paired terminals of the groups of series-connected conductors are connected to a plurality of testing means successively testing in an automatic manner whether or not each of the series-connected conductors forms a complete series connection. The test results of the testing means are displayed by display means.

3,594,636
ADJUSTABLE LENGTH FLUORESCENT BALLAST, SOCKET AND CIRCUIT ANALYZER

Milton E. Gibbs, Kearns, Utah, assignor to Rainbow Neon Sign Company

Filed May 21, 1969, Ser. No. 826,327
Int. Cl. G01r 31/02
U.S. Cl. 324—51 2 Claims

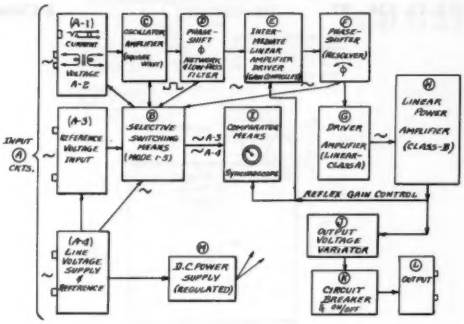


An elongated adjustable length body provided with terminals on its opposite ends and electrically connectable between the opposing sockets of a fluorescent light fixture in lieu of the associated fluorescent tube thereof. Corresponding end terminals of the body are electrically connected by conductors each having an electrical switch serially disposed therein and the conductors each have a pair of test terminals electrically connected therewith on opposite sides of the associated switch.

3,594,637
VARIABLE-PHASE POWER FREQUENCY GENERATOR-AMPLIFIER

Robert W. Beckwith, 1002 Greenfield Lane, Mount Prospect, Ill.

Filed July 1, 1968, Ser. No. 741,599
Int. Cl. G01r 25/00; H03b 5/24
U.S. Cl. 324—83 R 11 Claims

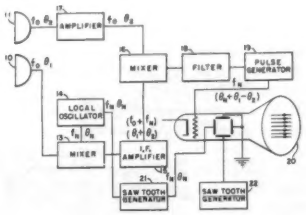


The disclosure relates to a power frequency generator-amplifier and solid-state circuitry and equipment affording test apparatus of highly compact, stable and versatile character adapted for use in either rack-mounting or portable embodiments, and capable of performance in selectable operating modes to effect a variety of tests and functions of particular interest to workers in the electric utilities field involving power frequencies in the 45 to 65 Hz. range commonly employed for power distribution and to function (among other capabilities) as a variable power and frequency generator, a phase meter and phase rotator and comparator and as a highly stable, linear power source and amplifier useful in testing and adjusting voltage, phase and frequency-sensitive equipment.

3,594,638
PHASE MEASURING APPARATUS

Robert H. Quint, Dorchester, Mass., assignor to The United Sates of America represented by the Secretary of the Navy

Filed Mar. 25, 1954, Ser. No. 418,795
Int. Cl. G01r 25/00
U.S. Cl. 324—85 1 Claim



A two-channel phase difference determination system in which the signal component in one channel is mixed with a local oscillator signal and the same signal component appearing in the second channel is mixed with the output of the first mixer. The resultant is filtered to phase only the local oscilla-

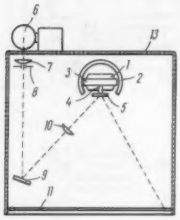
tor frequency, which now contains the phase difference information, and is compared with the phase of the local oscillator signal on the screen of a cathode-ray tube.

3,594,639

LIGHT-SPOT ELECTRICAL MEASURING INSTRUMENT

Abram Markovich Damsky, ulitsa Bratiev Vasilievykh, 7/4, kv. 6, and Boris Abelevich Seliber, ulitsa Rentgena, 15/31, kv. 53, both of Leningrad, U.S.S.R.

Filed Jan. 23, 1970, Ser. No. 6,029
Int. Cl. G01r *13/38, 13/40*
U.S. Cl. 324—97 **8 Claims**



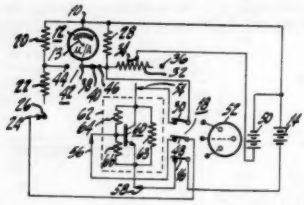
A switchboard light-spot electrical measuring instrument having an instrument movement with a permanent core magnet wherein an axial aperture is provided, an annular soft iron yoke surrounding the core magnet and having an aperture for passage of a light beam produced by an optical system, a moving coil being placed in the air gap formed between the core magnet and the annular yoke so that the core magnet is inside the moving coil, the moving coil being rotatably supported by means of a pair of taut bands passing through the axial aperture and arranged within the moving coil; the moving coil supporting a mirror near the aperture in the annular yoke between the core magnet and the annular yoke essentially within the height of the moving coil to reflect the light beam back through the aperture and onto a translucent screen with an adjacent scale plate.

3,594,640

CIRCUIT AND METHOD FOR MEASURING THE AMPLIFICATION FACTOR OF AN IN-CIRCUIT OR OUT-OF-CIRCUIT TRANSISTOR

Sander L. Knanishu, Tappan, N.Y., assignor to RCA Corporation

Filed Feb. 14, 1968, Ser. No. 705,356
Int. Cl. G01r *31/22*
U.S. Cl. 324—158 T **10 Claims**



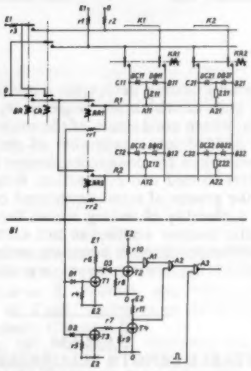
A method and a circuit for measuring the amplification factor (beta) of an in-circuit transistor is disclosed. A first potential of one polarity is applied across a first fixed resistor and the collector-emitter path of the transistor. A second potential of opposite polarity is applied across a first variable resistor and the first fixed resistor, the resistance of the first variable resistor being adjusted until the net voltage across the first fixed resistor is zero. The first potential is also applied through a second fixed resistor, a second variable resistor, and the base-emitter path of the transistor, and the second variable resistor is adjusted until a predetermined current flows through the first fixed resistor and the collector-emitter path of the transistor. A meter is provided for measuring the current through the first and second fixed resistors and obtaining their ratio.

3,594,641

ARRANGEMENT FOR INDICATING BACK CURRENTS IN A DIODE MATRIX BUILT UP BY MEANS OF BISTABLE ELEMENTS IN THE CROSSING POINTS

Harald Hoel, Vestby, Norway; Bertil Noro, Alvsjo, and Rolf Eriksson, Huddinge, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Oct. 29, 1969, Ser. No. 872,112
Claims priority, application Sweden, Nov. 8, 1969, 15171/68
Int. Cl. G01r *31/22, 15/12*
U.S. Cl. 324—158 D **2 Claims**



Arrangement for indicating back currents in a viz. matrix built up by means of bistable elements in the crossing points. In diodes of the type generally used in diode matrices normally a certain back current is existing. As long as the back current is low it will not disturb the function of the diode matrix, but if it should be too high it can occur that faulty crossing points are indicated. The arrangement makes it possible to indicate back currents in a diode matrix of a special type, viz. built up by means of a bistable element and two diodes in each crossing point.

3,594,642

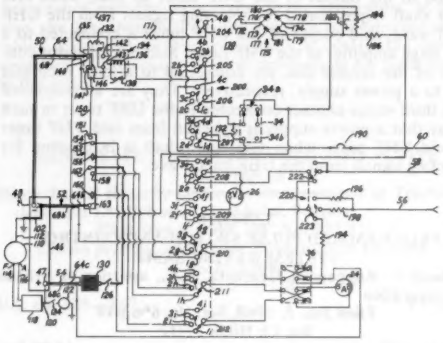
VEHICLE CHARGING, BATTERY, AND STARTING SYSTEM ANALYSIS METHOD AND APPARATUS

William B. Wright, Des Plaines, Ill., assignor to Sun Electric Corporation

Continuation-in-part of application Ser. No. 584,391, Oct. 5, 1966, now abandoned. This application Feb. 27, 1969, Ser. No. 803,043
Int. Cl. G01r *31/00, 15/12*
U.S. Cl. 324—158 R **21 Claims**

A method and apparatus for analyzing the charging, starting and battery systems of a vehicle by using an analyzer connected by three cables to the systems being analyzed. The apparatus includes a DC voltmeter, an AC voltmeter, a DC ammeter, a load resistor, and an isolating resistor that are interconnected in the systems under test in various combinations by a single master switch to enable measurement of various parameters in the systems under test. Each cable preferably

includes a current conductor and a voltage-sensing lead to enable measurement of voltage drops across elements of the



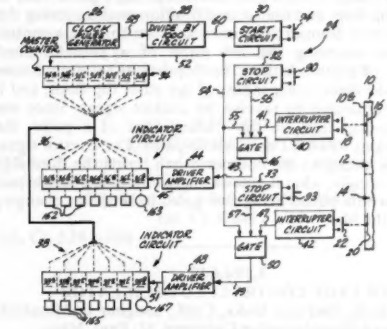
systems under test without introducing errors resulting from voltage drops in the current conductors.

3,594,643

ELECTRICAL TIMING APPARATUS WITH INTERRUPTIBLE TIME PRESENTATION

Theodore R. Hunt, Aloha, Oreg., assignor to Data Time, Inc., Beaverton, Oreg.

Filed May 22, 1969, Ser. No. 826,999
Int. Cl. G04f *9/00, 11/06*
U.S. Cl. 324—186 **3 Claims**



Electronic timing apparatus which, upon being started, maintains and normally presents for observation a running indication of the elapsed time of an event. The apparatus includes circuitry which may be triggered in response to some selected occurrence during the event to produce a short term interruption in the running time presentation, whereby the particular time presentation marking the occurrence is sustained for observation. After such an interruption, the time presentation automatically updates and continues to run.

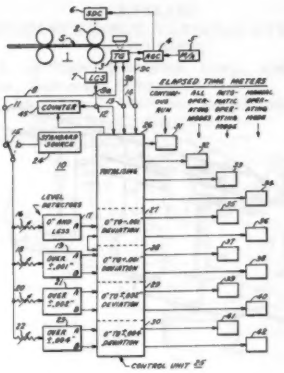
3,594,644

ELAPSED TIME REGISTERING APPARATUS WITH LEVEL DETECTORS

Harold A. List; Charles C. Pullen, and Richard S. Hostetter, Jr., all of Bethlehem, Pa., assignors to Bethlehem Steel Corporation

Filed Apr. 16, 1968, Ser. No. 721,651
Int. Cl. G04f *9/00;* **G01r** *19/16*
U.S. Cl. 324—181 **9 Claims**

A variable process signal is fed to several level detectors which send individual time variable signals to a control unit for the duration the variable process signal is maintained within each of several specified limits. Corelated time variable operating mode signals are also fed to the control unit. The control unit classifies each level of variable process signal according to duration under one or more operating



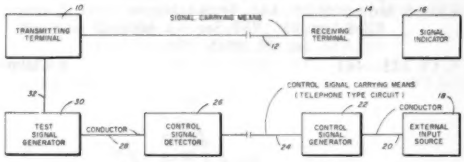
modes. Individual time meters register the elapsed time of each classified signal, thereby providing performance data on apparatus associated with the process signal. Means are provided for calibrating the level detectors and for counting apparatus operations.

3,594,645

MEANS FOR TESTING A SIGNAL TRANSMITTING CIRCUIT

Clyde E. Hallmark, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 18, 1968, Ser. No. 768,873
Int. Cl. H04b *1/00*
U.S. Cl. 325—31 **13 Claims**

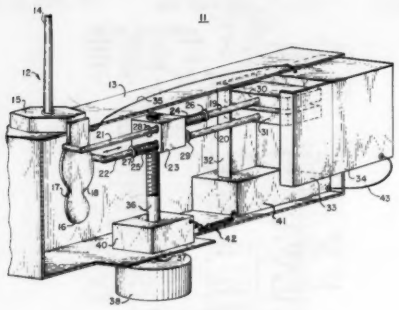


Means for testing a signal-transmitting circuit having a transmitting terminal, a signal-carrying means and a receiving terminal including a signal indicator connected to the receiving terminal to indicate the characteristics of the received signals, a control signal-carrying means paralleling the signal-transmitting circuit, a control signal generator located adjacent the transmitting terminal connecting to the control signal-carrying means for imparting a control signal onto the control signal-carrying means, a control signal detector located at the receiving terminal and connected to the control signal-carrying means for detecting the control signal and a test signal generator located at the transmitting terminal having an output connected to the transmitting terminal and an input connected to the control signal-carrying means whereby an operator at the receiving terminal may sequentially select test signals having different frequency and time domain characteristics for transmission over the signal-transmitting circuit, the performance of the signal-transmitting circuit being revealed by the signal indicator.

3,594,646
ANTENNA MATCHING DEVICE

Dieter R. Lohrmann, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 21, 1969, Ser. No. 868,238
Int. Cl. H04b 1/00
U.S. Cl. 325—160 3 Claims

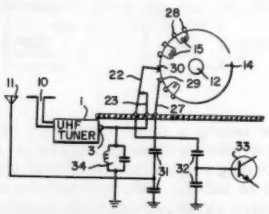


A radio including an antenna and an impedance-matching network for adjusting the impedance of the radio to match the impedance of the antenna over a range of operating frequencies. The antenna includes a radiating arm, a base portion and a cam surface attached to the base portion for indicating the impedance of the antenna over the range of operating frequencies. The impedance matching network is adjusted by a pair of cam followers which mate with the cam surface. A frequency tuning knob is connected by a threaded arm to the cam followers for moving the cam followers over the cam surface while the radio is being tuned by rotating the knob.

3,594,647
VHF TUNER SWITCHING SYSTEM ROTATING DISC TYPE UHF-VHF TUNER SWITCHING DEVICE

Koichi Ishigaki, Osaka-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 18, 1967, Ser. No. 661,623
Int. Cl. H04b 1/06
U.S. Cl. 325—461 6 Claims

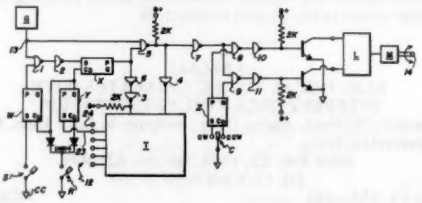


This invention concerns a VHF tuner switching system designed for selecting from among signals in the VHF and the UHF band waves in a combined VHF-UHF tuner. Said switching system comprises a first disc, a pair of discs and a second disc, all secured to a rotor shaft of the tuner. Each of said discs has a plurality of rotor contacts, having coils connected thereto, located around its periphery. The coils positioned on said first disc are for input circuits of the VHF tuner; those positioned on said pair of discs are for an inter stage double tuning circuit; and those positioned on said second disc control a local oscillator circuit. The selection of a signal in the VHF band is achieved by the engagement between said plurality of rotor contacts and a pair of stator contacts which are in contact with each of said discs during the rotation of said shaft. Said pair of stator contacts of said first disc are connected to an amplifier of the VHF tuner and to a VHF antenna, respectively. A third stator contact is connected to the output of the UHF tuner so that, when said rotor shaft is positioned for selecting signals from the UHF band wave, said output of the UHF tuner is connected to a first stage amplifier of the VHF tuner. Said pair of stator contacts of the second disc are connected to a local oscillator and to a power supply, respectively. They are accompanied by a third stator contact connected to the UHF tuner in such a way that a power supply is switched from said VHF tuner to said UHF tuner when said rotor shaft is in position for selecting signals from the UHF band wave.

3,594,648
PROGRAMMED PULSE SWITCH AND CONTROL SYSTEM HAVING SAME

Richard A. Rappaport, Henrietta, N.Y., assignor to Sybron Corporation

Filed Jan. 5, 1968, Ser. No. 696,049
Int. Cl. H03k 21/32
U.S. Cl. 328—48 14 Claims

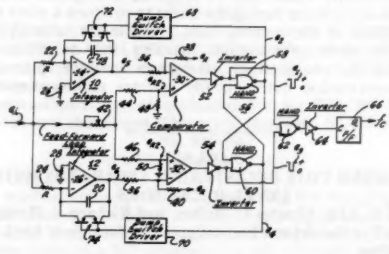


A first flip-flop, on being set enables gating a pulse train to a second flip-flop, and the second flip-flop enables gating the pulse train to a counter. The counter is set to emit a control signal upon counting the *n*th pulse of a predetermined number, *n*, of pulses. A third flip-flop has its set output connected to the direct clear inputs of the other flip-flops, and it set input connected to receive he control signal. Since the second flip-flop flips on the trailing edge of a pulse, the counter begins its count on a whole pulse. The control signal disables the gating to the counter, when it sets the third flip-flop. Accordingly, what it gates to the counter is *n* whole pulses, these whole pulses being also gated to set point changing means, or the like.

3,594,649
VOLTAGE-CONTROLLED OSCILLATOR

Charles Rauch, Sherman Oaks, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 14, 1969, Ser. No. 799,161
Int. Cl. H03k 3/00, 3/72
U.S. Cl. 328—150 16 Claims



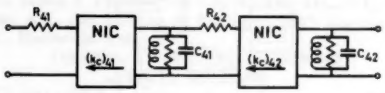
The disclosure is directed to a voltage-controlled oscillator using a pair of integrators coupled to a pair of voltage comparators and wherein the outputs of the voltage comparators

control a flip-flop. The output from the flip-flop is used to alternately control the individual ones of the integrators to operate in response to an analog input signal so as to produce an output signal from the flip-flop which has a frequency in accordance with the input signal to the integrators. In addition, the invention includes the use of a feed forward signal which is coupled to the comparators to control the time of operation of the comparators to compensate for fixed delays in the system.

3,594,650
BAND SELECTION FILTER WITH TWO ACTIVE ELEMENTS

Bengt Torkel Henoch, Alvsjo, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed May 5, 1969, Ser. No. 821,726
Claims priority, application Sweden, May 10, 1968, 6328/1968
Int. Cl. H03f *1/00*
U.S. Cl. 328—167 **9 Claims**

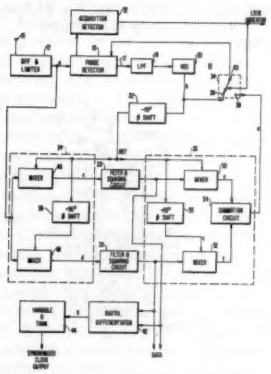


The invention relates to active band-selection filters with a band-selection transfer function of the second order. The filter contains resistances and lossy resonant circuits. A significant feature for filter circuits constructed in accordance with the invention is that they contain two active elements connected in such a way that the denominator of the transfer function has certain well-defined symmetry properties related to the circuit parameters of the two active elements and to the passive elements. In filters with these symmetry properties changes in the transfer function caused by variations in the active and passive filter elements are minimized and the manufacture of band-selection filter is simplified.

3,594,651
QUADRIPHASE MODEM

Chester J. Wolejsza, Jr., Rockville, Md., assignor to Communications Statellite Corporation

Filed Oct. 15, 1969, Ser. No. 866,676
Int. Cl. H04l *27/22*
U.S. Cl. 329—104 **5 Claims**

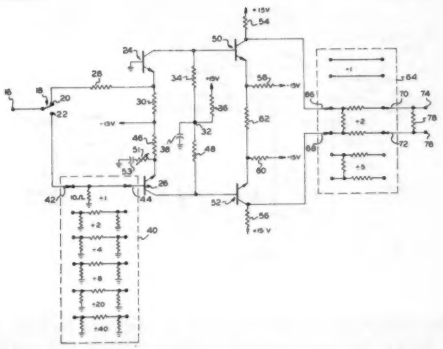


Apparatus responsive to a quadriphase modulated carrier generates a coherent reference signal having a fixed phase relation to the received carrier. The reference signal demodulates the received quadriphase modulated carrier. Prior to acquisition a phase-locked loop operates to lock the locally generated reference signal in phase with a received unmodulated portion of the carrier. Subsequent to acquisition the data detected by the demodulator remodulates the locally generated reference signal which is phase compared with the received quadriphase modulated carrier in the phase comparator of the phase-locked loop.

3,594,652
LOW IMPEDANCE INPUT, VARIABLE ATTENUATION AMPLIFIER

Johannes L. Springer, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 7, 1969, Ser. No. 813,944
Int. Cl. H03f *3/68*
U.S. Cl. 330—20 **5 Claims**

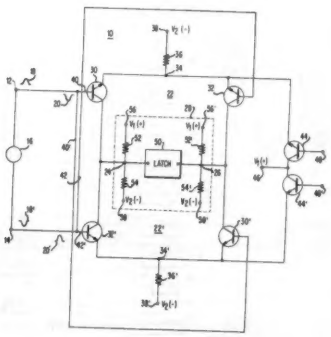


A variable attenuation amplifier includes a common base transistor stage and a common emitter transistor stage which are selectably connected to an input terminal. The common base state is employed to provide higher gain with low noise, while the common emitter stage is selected in the higher attenuation positions of the circuit.

3,594,653
CROSS-COUPLED DIFFERENTIAL AMPLIFIER

James J. Tomczak, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,384
Int. Cl. H03f *3/68*
U.S. Cl. 330—30 D **9 Claims**



A monolithic cross-coupled differential amplifier circuit for amplifying a bipolar input signal having a low signal-to-noise ratio. The differential amplifier circuit comprises two

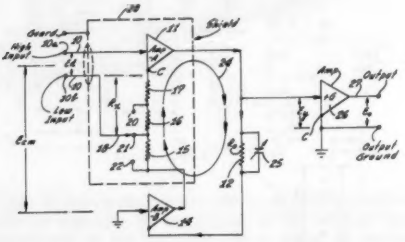
transistor differential amplifiers having cross-coupled inputs and a common output. Both amplifiers are normally biased on so that all differential mode and common mode input signals are normally rejected. Means is provided for cutting off one of the differential amplifiers when a differential or bipolar information signal appears at the input of the circuit, thereby permitting the other differential amplifier to provide at the common output an amplified version of the input signal. By selectively controlling which of the differential amplifiers is cutoff, the polarity of the differential output signal is made independent of the polarity of the input signal.

3,594,654

DIRECT-COUPLED DIFFERENTIAL AMPLIFIER

Ralph D. Hasenbalg, Thousand Oaks, Calif., assignor to Delaware SDS, Inc., El Segundo, Calif.

Filed Sept. 13, 1968, Ser. No. 759,588
Int. Cl. H03f *1/00, 3/68*
U.S. Cl. 330—69 **9 Claims**



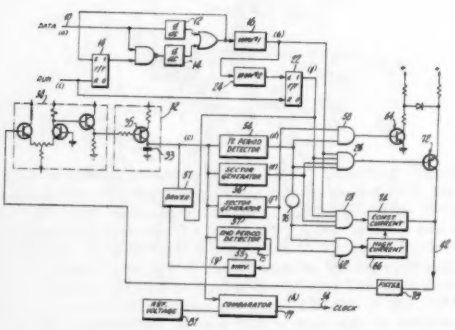
The differential amplifier system as disclosed includes a loop of high-gain amplifier, resistor, medium gain amplifier and another resistor, using output and reference terminals of the amplifier for making the connections. Input is applied to the input of the high-gain amplifier and across the resistor connected to the reference terminal of the latter, the input of the other amplifier is grounded. The output is taken from across the other resistor.

3,594,655

CLOCK SIGNAL GENERATOR USING A SAWTOOTH OSCILLATOR WHOSE FREQUENCY IS CONTROLLED IN DISCRETE STEPS

Frederick Reisfeld, Commach, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Filed July 8, 1969, Ser. No. 839,927
Int. Cl. H03b *3/04*
U.S. Cl. 331—14 **7 Claims**



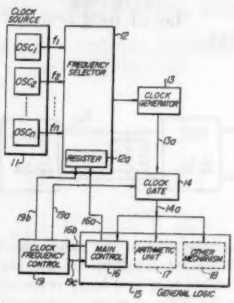
A clock signal generator for generating timing signals in response to more or less regularly occuring signals in which the frequency of a sawtooth oscillator is varied in discrete steps in accordance with the time relationship between the oscillator output and the regular occurring signal.

3,594,656

AUTOMATIC CLOCK FREQUENCY-SWITCHING SYSTEM

Yoshihiro Tsukamoto, Hatano, Japan, assignor to Kogyo Gijutsuin, Tokyo, Japan

Filed Mar. 24, 1970, Ser. No. 22,182
Claims priority, application Japan, Apr. 8, 1969, 44/26590
Int. Cl. H03b *3/00*
U.S. Cl. 331—49 **9 Claims**



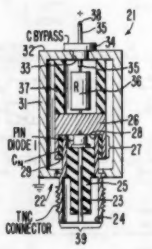
An automatic clock frequency-switching system for electric systems such as electronic computer systems comprising a clock source including a plurality of oscillators generating frequencies different from one another, and a clock frequency control capable of performing a stable operation even during the period when clock is interrupted. While the clock frequency is being switched, the supply of clock to a mechanism which is operative in response to clock pulses is stopped. After the clock frequency has been switched clock is supplied to the mechanism to resume the operation thereof.

3,594,657

HIGH FREQUENCY COAXIAL LINE CIRCUIT FOR AN AVALANCHE DIODE NOISE GENERATOR

Edward J. Cook, Hamilton, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 11, 1969, Ser. No. 815,465
Int. Cl. H03b *7/14, 29/00*
U.S. Cl. 331—78 **8 Claims**



The coaxial line circuit for an avalanche diode noise generator is disclosed. The coaxial line circuit includes a short at one end thereof with the avalanche diode connected in series with the inner conductor at the shorted end of the coaxial line. The short preferably includes a block of ther-

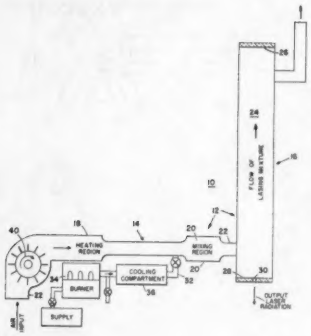
mally conductive material closing off the end of the coaxial line with one terminal of the diode being connected to the block for heat sinking the diode. In addition, the shorting block includes a portion concentric to and axially coextensive with the end portion of the outer conductor of the transmission line to form a relatively high capacitance between the outer conductor and the shorting block. This capacitance stores the energy for the relaxation oscillator mode of the avalanche diode which is preferably operated as a noise generator. In another embodiment, a wave-reflective member is placed within the coaxial line a distance from the short-circuited end thereof to produce a subharmonic cavity for increasing the power density of the noise spectrum output at higher harmonics of the cavity. In another embodiment, a varactor diode is placed in the coaxial transmission line at a point of maximum electric field of the output mode for tuning the output frequency of the noise.

3,594,658

HIGH-PRESSURE LASER HAVING THERMAL-PUMPING MEANS

Charles M. Cason, III, 7114 Criner Road, S.E., Huntsville, Ala.; James F. Perkins, 1808 Melbourne Ave., N.E., Huntsville, Ala., and Thomas A. Barr, Jr., 7803 Martha Drive, S.E., Huntsville, Ala.

Filed Nov. 27, 1967, Ser. No. 690,045
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **9 Claims**



Apparatus, including an optical cavity, in which a thermally heated gas is mixed with a relatively cold gas of different chemical or isotopic composition. The cold gas is disposed for excitation (pumping) by the hotter gas for providing lasing action. In the present invention the gases are mixed at their respective equilibrium temperatures, in a ratio which will provide the necessary population inversion to produce coherent energy. The apparatus includes a housing having first and second sections. The pumping gas is admitted and heated in the first section and the second or lasing gas is mixed with the heated gas in a mixing chamber and expanded into a lasing chamber in a second section of the housing. Optical feedback means, such as a pair of mirrors are disposed at opposite ends of the second housing section. One of the mirrors covers the entire cross section of the housing to reflect coherent energy to the second mirror which may be partially transmitting or provided with a slit therein to direct the coherent energy from the housing.

The interaction of the gases in the mixing and lasing chambers results in an inversion of population of energy levels in the gases to provide optical gain at a frequency or frequencies corresponding to differences in energies of levels which are totally or partially inverted.

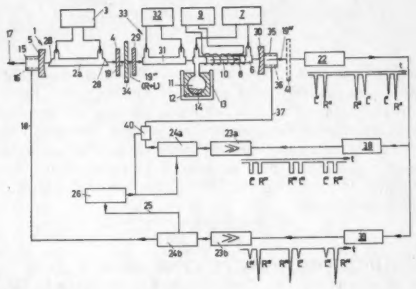
The invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to us of any royalty thereon.

3,594,659

DEVICE FOR THE FREQUENCY STABILIZATION OF A GAS LASER OSCILLATOR

Hanspeter Brandli, Munchenbuchsee, and Rene Dandliker, Munsingen, both of, Switzerland, assignors to Institut fur Angewandte Physik der Universitat, Bern, Bern, Switzerland

Filed Jan. 12, 1968, Ser. No. 697,488
Claims priority, application Switzerland, Feb. 8, 1967, 1,878/67
Int. Cl. H01s *3/10; Hols 3/22*
U.S. Cl. 331—94.5 **3 Claims**



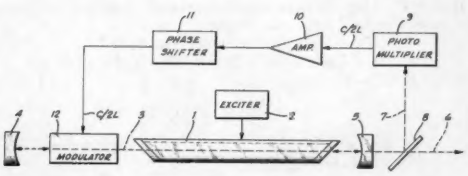
A device for the frequency stabilization of a gas laser oscillator, wherein the oscillator is formed by a laser between two reflectors, the laser consisting of a tube filled with helium and neon, the latter free of isotopes. An error signal is obtained corresponding to the deviation of a resonant frequency from its standard value in that a right and a left circularly polarized component of the laser beam are absorbed when passing the tube wherein a magnetic field and a gas discharge are maintained. Absorption of the two components occurs to different degree due to the Zeeman effect, and a magnitude corresponding to this difference is established as a function of the frequency. The error signal controls the distance of the two reflectors from each other.

3,594,660

MODE-LOCKED LASERS

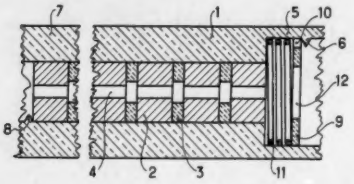
George R. Huggett, Sunnyvale, Calif., assignor to Spectra-Physics, Inc., Mountain View, Calif.

Filed Aug. 29, 1968, Ser. No. 756,252
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **1 Claim**



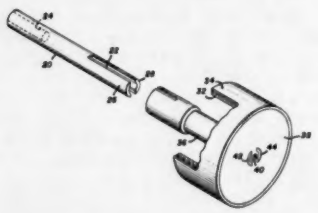
A mode-locked laser in which a beat signal of the longitudinal modes is amplified and applied to an intraresonator modulator to form a self-oscillator for driving the modulator at a frequency which automatically changes to compensate for changes in mode spacing resulting from environmental perturbations of the resonator.

3,594,661
GAS LASER TUBE
Maurice Roulot, Orsay, France, assignor to Compagnie Generale D'Electricite, Paris, France
Filed Nov. 27, 1968, Ser. No. 779,513
Claims priority, application France, Nov. 30, 1967, 130,482
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 1 Claim



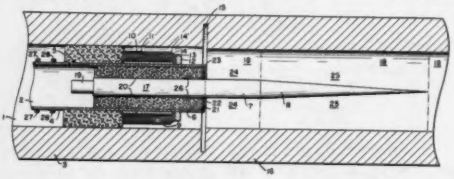
A gas laser comprises an outer tube and a plurality of graphic and ceramic rings placed inside the tube. The rings are in the form of a stack which is blocked on one end by lugs welded to the inner surface of the tube. The other end of the stack emerges into a free space formed by an enlarged area arranged in the inner surface of the tube and is held by a disc which is biased against lugs placed on the inner surface of the enlargement.

3,594,662
HIGH FREQUENCY CAVITY OSCILLATOR
John D. Crawford, Sr., Owensboro, Ky., assignor to General Electric Company
Filed Dec. 22, 1969, Ser. No. 887,194
Int. Cl. H03b 5/18
U.S. Cl. 331—97 8 Claims



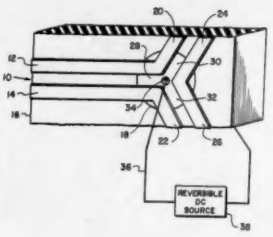
A high frequency coaxial cavity oscillator is provided having improved tuning stability when subject to high vibration conditions. The oscillator is constructed to provide a maximum of coaxial symmetry to reduce the effects of vibrations. The oscillator further provides an improved heat radiating path from the internal portions of the oscillator.

3,594,663
DUAL-POLARIZED DUAL-FREQUENCY COUPLER
Daniel C. Allen, Kennebunkport, Maine, assignor to Maremont Corporation, Saco, Maine
Filed Mar. 16, 1970, Ser. No. 19,668
Int. Cl. H01p 5/12; H03h 7/04; H01p 1/16
U.S. Cl. 333—1 10 Claims



A waveguide transition coupler having a coaxial waveguide and a first circular waveguide formed inside the center conductor of the coaxial waveguide for coupling with a second circular waveguide. Two frequencies of two orthogonally polarized waves in the TE 11 mode are propagated together through the second circular waveguide while each frequency is propagated separately by the first circular and coaxial waveguides. Isolation of the two frequencies is secured in the coaxial and first circular waveguide by dimensioning the first circular waveguide so that it is beyond cutoff for the lower frequency, and by placing a distributed choke-transformer in the coaxial waveguide to attenuate the higher frequency electromagnetic waves. Unwanted mode conversion is inhibited in the energy transfer by a tapered pin inserted through both circular waveguides and impedance-matching elements are provided.

3,594,664
SLOT-LINE CIRCULATOR
Nathan Lipetz, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army
Filed Apr. 11, 1969, Ser. No. 815,430
Int. Cl. H01p 1/32, 5/12
U.S. Cl. 333—1.1 5 Claims

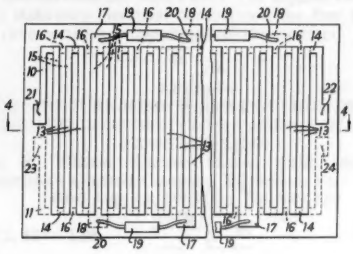


A slot-line circulator having a ferrite disc either coated on or embedded and integral with a dielectric substrate on one surface of which there is provided a narrow gap in a conductive coating to form a slot line adapted to propagate microwave energy. The energy-propagating slot line extends substantially halfway across the surface of the ferrite disc at which point the conductors forming the slot-line gap are branched outwardly to form an angle of substantially 120°. Respective conductive coatings are provided parallel to and spaced from each of the branched conductors to form two slot-line arms, or channels, which connect to the wave-propagating slot line to form a Y-junction. The width of the conductive coatings and the spacing or gap therebetween for each of the Y-junction channels is identical. A current-carrying latching wire is provided through the center of the ferrite disc and is connected to a reversible DC source of to establish a circumferential DC magnetic bias field in the ferrite in either of two directions.

3,594,665
DELAY LINES WITH ADDED SHUNT CONDUCTANCE
Eric Metcalf, and Edward A. Martin, both of Farnborough, England, assignors to The Solartron Electronic Group Limited, Farnborough, England
Filed Nov. 14, 1968, Ser. No. 775,725
Claims priority, application Great Britain, Nov. 22, 1967, 53239/67
Int. Cl. H03h 9/30
U.S. Cl. 333—31 9 Claims

A delay line in which resistors or resistive films are connected between conducting strips so to shunt-load the line

that L/R is substantially equal to C/G, where for a predetermined unit length of line L is the series inductance, R is the



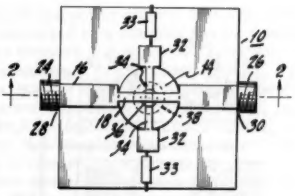
series resistance, C is the shunt capacitance and G is the shunt conductance.

3,594,666

GYROMAGNETIC NOTCH FILTER

Anastas Boornard, Barrington, N.J., assignor to RCA Corporation

Filed Sept. 6, 1968, Ser. No. 757,951
Int. Cl. H03h *13/00;* **H01p** *5/04, 1/32*
U.S. Cl. 333—73 S **6 Claims**



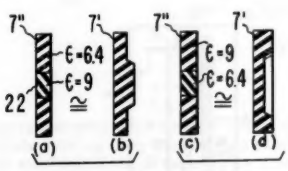
A notch filter is disclosed which includes a pair of conductors extending transversely of each other in a crosslike configuration, the conductors being insulated from each other. A ball of ferri- or ferromagnetic material is positioned between the two conductors where they cross. A magnetic field is applied to the ball and, by variation of the field, a band of waves that is applied to one end of one of the conductors does not arrive at the other end of said conductor but is dissipated in resistors connected to the ends of the other conductor.

3,594,667

MICROWAVE WINDOW HAVING DIELECTRIC VARIATIONS FOR TUNING OF RESONANCES

Joseph K. Mann, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Nov. 15, 1968, Ser. No. 776,088
Int. Cl. H01p *1/08*
U.S. Cl. 333—98 P **4 Claims**



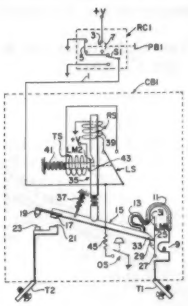
A high-power microwave window structure is disclosed. The window structure includes a hollow waveguide having a dielectric wave permeable gastight partition sealed thereacross to form the window assembly. The window structure is capable of being impedance matched to the waveguide structure to provide a relatively wide passband. In certain windows the passband can be as wide as the recommended bandwidth for the waveguide itself. Such window structures are plagued by "trapped" and "ghost" resonant modes which are excited into resonance by slight asymmetries in the window structure. At their resonant frequencies, these modes couple energy from the main propogating mode to produce an impedance mismatch and at high-power levels, overheating and failure of the window structure. Thus, operation at high-power levels is typically restricted to frequency ranges between a pair of such resonant modes. The frequency separation between the resonant modes is increased to provide broader band operation by selectively tuning the resonant frequencies of these modes by selectively varying the electrical path length through the window structure for one or more of these modes. For example, the window is made thicker near the periphery where one of the resonant modes has its most intense electric fields and made thinner near the center where another of the modes has its intense electric fields to tune one of the modes higher in frequency, while the other mode is being tuned lower in frequency. The mean thickness of the window is maintained approximately constant such as not to change appreciably the passband for the main propagating mode. Alternatively, the dielectric constant for various portions of the window can be changed for changing the electrical path length through the window as aforedescribed.

3,594,668

REMOTE CONTROL CIRCUIT BREAKER

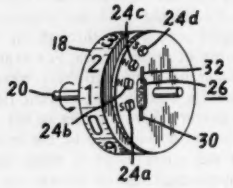
David E. Clarke, Attleboro, and William G. Foley, Dorchester, both of, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 2, 1970, Ser. No. 000,473
Int. Cl. H01h *77/02*
U.S. Cl. 335—13 **18 Claims**



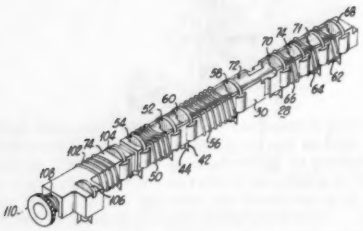
A miniature remote control circuit breaker in which a movable contact member including a movable contact is engageable with a fixed contact. Motor means, such as a solenoid and an armature actuated thereby, move the contact member from a contacts-open position to a contacts-closed position when the solenoid is energized by remote switch means. Preferably a linkage including two resiliently connected driving members is employed to couple the motor means to the contact member. Condition-sensing (e.g. current-sensing) latch means retain the contact member in its contacts-closed position until the condition sensed varies beyond a predetermined value whereupon the latch means releases the contact member, thereby opening the contacts independently of the energization of the motor means. Further latch means are provided to retain the contact member in its closed position. The latter latch means are responsive to further actuation of the remote switch means thereby to release the contact member and separate said contacts. A further solenoid and armature are preferably provided to effect the release of the further latch means in response to further actuation of the remote switch means.

3,594,669
CONTROL DEVICE FOR REED SWITCH
Mitsunori Yamane, and Masayuki Hayashi, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Toyko, Japan
Filed July 31, 1969, Ser. No. 846,355
Claims priority, application Japan, Aug. 7, 1968, 43/55956
Int. Cl. H01h 41/00
U.S. Cl. 335—207 3 Claims



Four permanent magnets are disposed at predetermined angular intervals equal to an angle of 36° on a circular magnetic substrate by having the S pole faces of the first and fourth magnets and the N pole faces of the second and third magnets fixed to the substrate on a circle concentric to it. With the substrate rotated, a reed switch above it faces successively the first and second magnets to close the switch, the second and third magnets to open the switch, and the third and fourth magnets to again close the switch to permit pulses to be generated.

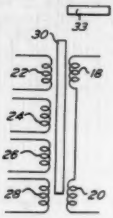
3,594,670
TUNING COIL ASSEMBLY
Morton L. Weigel, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.
Division of Ser. No. 845,630, July 7, 1969, Pat. No. 3,521,677 which is a continuation of Ser. No. 660,983, Aug. 16, 1967, abondoned.
Filed May 13, 1970, Ser. No. 36,807
Int. Cl. H01f 27/30
U.S. Cl. 336—20 3 Claims



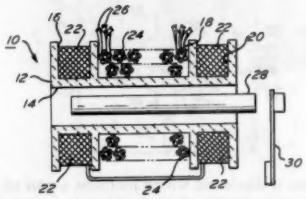
Tuning coil units for use in television tuners are provided which have been automatically aligned to the desired channel frequency by deforming the turns of the respective tuning coils in such manner as to cause them to take a permanent set at the proper inductance value to receive a desired television channel. The coil turns are deformed inwardly into a recess in the coil form so that the coil turns are tightly stretched about the coil form and maintain their adjusted inductance value during assembly and usage in the television tuner.

3,594,671
TRANSDUCER MEANS
Amotz Frenkel, Lansdale, Pa., assignor to Transducer Systems, Inc., Willow Grove, Pa.
Filed May 22, 1969, Ser. No. 826,859
Int. Cl. H01f 21/06
U.S. Cl. 336—130 12 Claims

A transducer of the proximity type having a primary winding, a plurality of separate secondary windings, and a core. The secondary windings are positioned with respect to the primary winding so that each of the secondary windings has a different output signal created by the same input signal to the primary winding. The different output signals are also caused to change in amplitude differently when a metal member is moved toward and away from the core of the transducer.

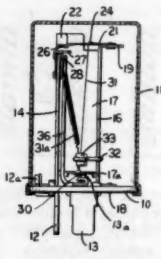


3,594,672
TRANSDUCER DEVICE
Amotz Frenkel, Lansdale, Pa., assignor to Transducer Systems, Inc., Willow Grove, Pa.
Filed July 10, 1969, Ser. No. 840,776
Int. Cl. H01f 21/06
U.S. Cl. 336—132 5 Claims



A transducer device having a primary winding, a plurality of secondary windings and a core electrically coupling the secondary windings with the primary winding. The secondary windings comprise a plurality of insulated wires bundled together and wound as a helical winding so that when an input signal is applied to the primary winding a separate output signal is induced in each of the secondary windings.

3,594,673
FLASHER SWITCH
Cleon F. Frey, Sebastian, Fla., assignor to International Flasher Corporation, Bayamon, P.R.
Filed Dec. 10, 1969, Ser. No. 883,914
Int. Cl. H01h 37/50
U.S. Cl. 337—136 3 Claims



A "hot-wire"-type thermally responsive flasher switch in which a channel-shaped support member carries a snap vane

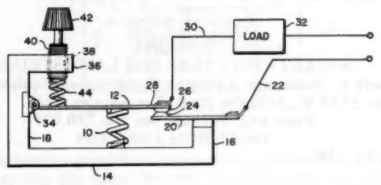
at one of the support member ends, the vane spanning the flange portions of the support member. A thermal expansion wire extends the length of the support member and within its channel configuration and exerts a buckling force on the vane intermediate the vane's ends. The support member carries a stationary electrical contact and the free end of the snap vane carries a cooperating movable contact.

3,594,674

TEMPERATURE-RESPONSIVE CONTROL DEVCIES ADJUSTABLY RESPONSIVE TO VARIOUS OPERATING TEMPERATURES

James R. Willson, Garden Grove, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 13, 1969, Ser. No. 849,835
Int. Cl. H01h 37/32, 37/46
U.S. Cl. 337—139 25 Claims



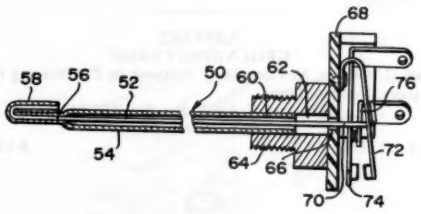
Temperature-responsive control device including a control member constructed of a material having a temperature-actuated shape memory and means for adjustably changing the operating temperature of the control device. The operating temperature may be adjusted by varying the stress on the control member with deadweights or springs, by maintaining a constant high rate spring load on the control member while adjusting the operating point of the control member, or by maintaining a constant operating point and a constant load on the control member while varying the rate of the load as it is applied to the control member.

3,594,675

TEMPERATURE-SENSING PROBE

James R. Willson, Garden Grove, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 28, 1969, Ser. No. 828,629
Int. Cl. H01h 37/50; G01k 5/48
U.S. Cl. 337—140 9 Claims



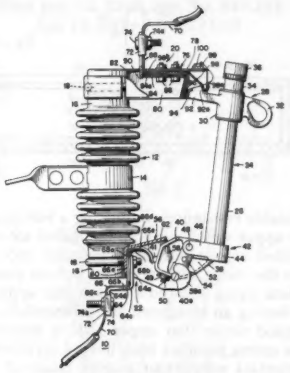
A temperature-sensing probe in the form of a rod or wire body is made from an alloy composition exhibiting a characteristic of mechanical shape memory as a result of martensitic-type transformation. Such body is possessed with a shape memory upon which a selected controlled shape has been previously impressed and is deformable at temperatures below a selected shape memory transition temperature. It is capable of doing work while returning to such selected control shape at the selected shape memory transition temperature from a deformed shape. There is a control device upon which it performs such work.

3,594,676

ELECTRICAL CUTOUT

Donald O. Misare, Riverside, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Aug. 14, 1969, Ser. No. 850,078
Int. Cl. H01h 71/08, 71/10, 85/54
U.S. Cl. 337—180 6 Claims



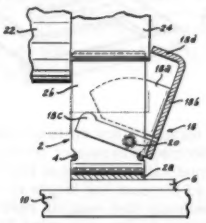
An electrical cutout comprising a first terminal and a of terminal movable on a path into and out of contact therewith. The first terminal includes a contact member having a free end portion extending generally transversely across said path and deflectable along the path during the making and breaking of contact with said second terminal. The second terminal includes a contact surface extended generally transversely of said path adapted to provide a low resistance current interchange point when in contact against the deflectable free end portion of the first terminal. The first terminal includes a terminal support bracket having stop means extended transversely across said path for limiting the movement of the free end portion of the contact member and a sleet hood on which the bracket is mounted, which sleet hood includes integrally formed top, side, and end walls.

3,594,677

RETAINER FOR BLADE-TYPE ELECTRICAL FUSE CLIP

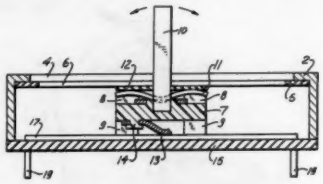
Frank A. De Backer, Wichita, Kans., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 20, 1970, Ser. No. 12,959
Int. Cl. H01h 85/48
U.S. Cl. 337—215 5 Claims



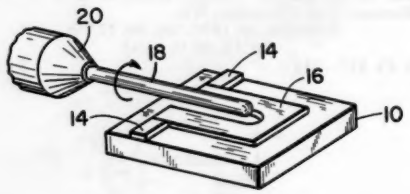
A connector clip for a blade-type electrical fuse has a steel bracket pivotally attached by a rivet passing through both legs of the clip near the closed end. The bracket has legs disposed closely adjacent the outer sides of the clip to prevent lateral distortion of the clip. A third bracket leg extends inside the clip to lie under the fuse blade and an arm of the bracket extends upward and over the fuse blade. Upon insertion of the fuse blade into the clip the blade engages the third leg to pivot the arm over the top of the blade. Outward movement of the blade is prevented by the overlying arm which must be manually pivoted out of the way to permit removal. No tool is required to either install or remove the fuse.

3,594,678
ADJUSTING RESISTANCE
Yukihiko Nomura, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Apr. 17, 1970, Ser. No. 29,443
Claims priority, application Japan, Dec. 23, 1969, 44/122844
Int. Cl. H01c 9/02
U.S. Cl. 338—183 20 Claims



An adjustable resistance comprising a box-shaped body including an upper wall having an elongated slit and a bottom plate provided with a resistance element and a conducting element on the inside surface of the bottom plate, a fixed insulating plate being located beneath the upper wall of the body and having an elongated slit substantially aligned with said elongated slit in that upper wall, a movable insulating plate and a spring member both having registering apertures, a sliding contact support or carrier made of an insulating material and having a knob which is passed through said registering apertures of the spring member and the movable insulating plate to project outwardly through said aligned slits, a plurality of projections being provided on the sliding contact support, and a sliding contact piece mounted on the lower surface of the sliding contact support, whereby under the resilience of the spring member said sliding contact piece is urged against said resistance element and said conducting element.

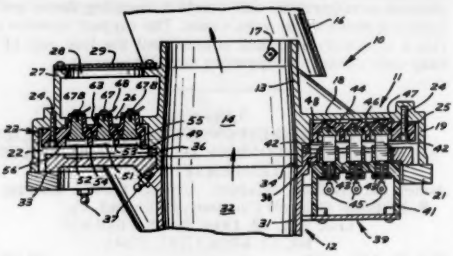
3,594,679
METHOD OF MAKING LOW NOISE FILM RESISTORS AND ARTICLE
Robert T. Seay, and Terry P. Smith, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.
Filed Apr. 18, 1968, Ser. No. 722,439
Int. Cl. H01c 9/00
U.S. Cl. 338—195 5 Claims



A method of forming a low current noise, thin film resistor having a thin electroconductive or resistive film applied to a dielectric substrate with a portion of the film thereafter being removed so as to increase the length to width ratio thereof. The method includes the step of rubbing, smoothing, or polishing the edges of the remaining film surrounding the area where said portion was removed with a rubberlike member whereby resistor current noise is significantly decreased.

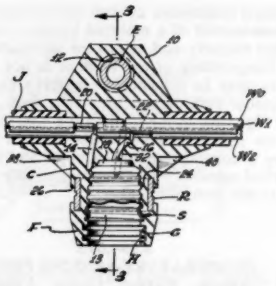
3,594,680
SLIPRING UNIT
Floyd E. Buschbom, Long Lake, Minn., assignor to VanDale Corporation, Wayzata, Minn.
Division of Ser. No. 501,159, Oct. 22, 1965, Pat. No. 3,438,123.
Filed Oct. 23, 1968, Ser. No. 793,212
Int. Cl. H01r 39/34
U.S. Cl. 339—8 10 Claims

An electrical slipring having a nonconductive support with a plurality of circular recesses and bores open to the bottom of each recess. A flat annular electrical conductive member is located in each recess. Each member has a boss located in



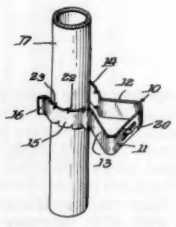
a bore in the support. Fasteners projected through the support secure the annular members to the support.

3,594,681
SOCKET STRUCTURE FOR LAMP STRING
Hubert L. Weiss, c/o American Construction Equipment Co. Inc. 5055 W. Jefferson Blvd., Los Angeles, Calif.
Filed Aug. 5, 1968, Ser. No. 750,095
Int. Cl. H01r 3/06, 33/34
U.S. Cl. 339—14 3 Claims



The lamp string L (FIG. 4) has a series of identical socket assemblies A (FIGS. 1 and 2) each including a rubber case C cast about a standard screw socket S. A bulb cage B (FIG. 4) is carried on a ground ring R. The ground ring R is closely located about the socket S and positioned to shield the socket S from destructive forces. Grooves G and H trap moisture.

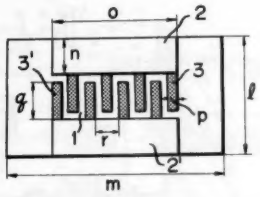
3,594,682
GROUNDING CLAMP
Dale G. Oleson, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa
Filed Aug. 7, 1968, Ser. No. 750,864
Int. Cl. H01r 3/06
U.S. Cl. 339—14 8 Claims



The grounding clamp is formed from a single strip of spring metal and is so shaped as to employ to a considerable

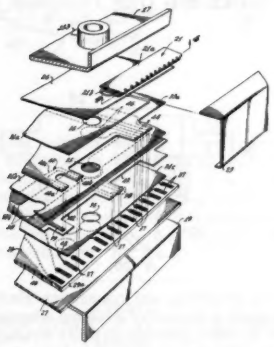
extent the inherent resiliency of the metal in the attaching of the clamp to a conductive member. At least one edge of the clamp is formed with sharp barbs for good electrical conductivity.

3,594,683
PHOTOCONDUCTIVE CELL
Kazuhiko Ihaya, Tokyo, Japan, assignor to Canon Camera Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 21, 1968, Ser. No. 707,263
Claims priority, application Japan, Feb. 27, 1967, Mar. 9, 1967, May 31, 1967, 42/12412;42/14902;42/34711
Int. Cl. H01c *7/08*
U.S. Cl. 338—15 **8 Claims**



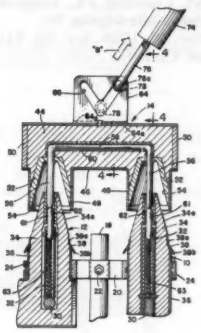
This invention provides a photoconductive cell and means for producing the same for use in photometry having the specific property that current flowing through the cell is substantially proportional to the logarithm of the intensity of illumination of luminous flux. The electrodes of the cell have a resistance value corresponding to a value intermediate the value of specific resistance which the photoconductive body exhibits between the upper and lower limits of the photometric range. The electrodes of the cell have no rectifying property or only a slight rectifying property relative to the photoconductive body, and when it is difficult to obtain the desired specific resistance from a production point of view or for any other reason, material of the electrodes may be selected from one or more kinds of materials whose work function is the same or similar to that of the photoconductive body.

3,594,684
ELECTRICAL INTERCONNECTION SYSTEM FOR MULTILAYER CIRCUITRY
Meryl E. Miller, Palos Verdes Peninsula, Calif., assignor to Datanetics Corporation, Redondo Beach, Calif.
Filed May 12, 1969, Ser. No. 823,793
Int. Cl. H05k *1/04*
U.S. Cl. 339—17 LM **36 Claims**



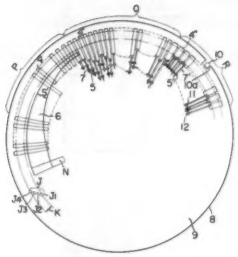
A multilayer electrical circuit package wherein interconnections between various thin circuit layers lying in different planes are accomplished by selectively located overlying electrically conductive peripheral contact tabs in the planes of the thin circuit layers, the contact tabs of each layer being spring biased into electrically contacting engagement with the tabs of other layers.

3,594,685
ELECTRICAL COUPLER
Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.
Filed July 14, 1969, Ser. No. 841,265
Int. Cl. H01r *13/62, 31/08*
U.S. Cl. 339—19 **6 Claims**



A coupler for making or breaking contact with the end of a fixed terminal comprising a body having terminal means on one side adapted for contact with the fixed terminal and bracket means extending outwardly on an opposite side. An elongated slot is formed in the bracket means for slideably receiving the pin of a hot stick used for moving the coupler toward and away from the fixed terminal to make and break contact therewith, the slot extending in a general direction toward and away from the end of the fixed terminal and including stop surfaces at opposite ends. The hot stick pin is freely movable between the stop surfaces and is engageable therewith to exert force on the coupler to make or break contact with the fixed terminal.

3,594,686
SLIDING-TYPE VARIABLE RESISTOR HAVING THIN FILM RESISTOR LAYER COMPRISING STRAP RESISTORS
Tatsuo Fujii, Tokyo; Yutaka Watano, Tohyo, and Masaaki Tsukamoto, Kawasaki-shi, all of, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan
Filed Jan. 22, 1970, Ser. No. 4,987
Claims priority, application Japan, Jan. 31, 1969, 42/7905
Int. Cl. H01c *9/02*
U.S. Cl. 338—89 **1 Claim**



The sliding-type variable resistor including thin film strap resistor layers formed by vacuum deposition, spattering, etc.

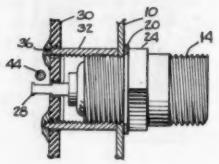
upon an insulating material base, a plurality of tap electrodes and a sliding brush slidable thereover. Tap electrodes are arranged in the path of travel of the brush and extended in one direction from the path. Strap resistors are arranged with the same pitch as that of the tap electrodes and one end of the resistor overlays on the extended portion of the corresponding tap electrode. Each strap resistor overlays on the ends of two strap connectors, and each strap connector overlays on two adjacent strap resistors.

3,594,687

CONNECTOR FOR COUPLING A COAXIAL CABLE TO A PRINTED CIRCUIT BOARD OR THE LIKE

Donovan C. Alderfer, Lansdale, Pa., assignor to Jerrold Electronics Corporation, Philadelphia, Pa.

Filed Mar. 28, 1969, Ser. No. 811,489
Int. Cl. H01r *11/28, 15/14*
U.S. Cl. 339—14 4 Claims



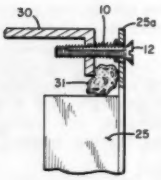
A device for coaxial cable connection to a planar circuit is described. A receptacle having a suitable bore is provided at one end with ears which project into apertures of a circuit board. The ears protrude through the circuit board for electrical grounding of the receptacle. The ears provide a rotational lock of the receptacle to therewith permit a firm stable connection to a coaxial cable at the other end of the receptacle.

3,594,688

LOW-RESISTANCE GROUNDING MEMBER

William A. Muska, 1378 Ryan, Roseville, Minn.; James C. Schacker, 1504 Edgewater, Arden Hills, Minn., and Earl E. McHattie, 2129 Midlothian Road, Roseville, Minn.

Filed Apr. 16, 1969, Ser. No. 816,666
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R 7 Claims



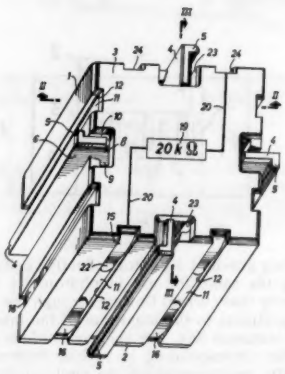
A threaded fastening and grounding member having an upward projecting lip for frictionally engaging a threaded recess in a flush-mounting box to provide a low-resistance electrical-grounding connection between the fastening member and the threaded recess.

3,594,689

BUILDING BLOCK FOR ELECTRICAL OR ELECTRONIC CONSTRUCTION KITS

Rudolf Hopt, Rottweil; Rudolf Mayer, Rottweil; Lothar Volkheimer, Trossingen, and Peter Hengstler, Deisslingen, all of, Germany, assignors to R. & E. Hopt KG,, Rottweil, Germany

Filed July 12, 1968, Ser. No. 744,483
Claims priority, application Germany, Sept. 23, 1967, June 1, 1968, P 16 03 375.3; P 17 03 517.5
Int. Cl. H01r *23/08*
U.S. Cl. 339—17 26 Claims



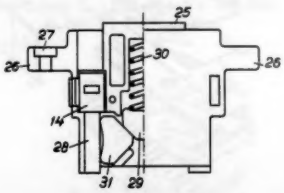
A building block for electrical or electronic construction kit is formed of a boxlike member having electrical contacts disposed on the outer surface thereof and contains electrical or electronic components within its interior portion. A plurality of blocks may be slideably attached together by a engaging web which protrudes perpendicular to the surface of the sides of the block from a recessed portion in the surface of the block. The shape of a section of the recessed portion and the protruding web coincide so that the blocks may be interlocked with each other.

3,594,690

CONNECTION SOCKET

Malte Ljungner, Vasteras; Lembit Jaaksoo, Hokasen, and Arne Johansson, Vasteras, all of, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

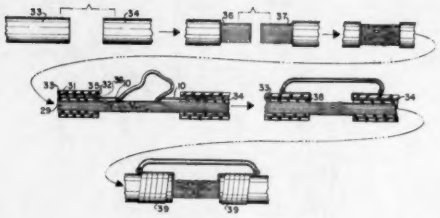
Filed Dec. 26, 1968, Ser. No. 787,178
Claims priority, application Sweden, Dec. 29, 1967, 17972/67
Int. Cl. H01r *31/08, 17/20, 9/08*
U.S. Cl. 339—19 5 Claims



A socket for mounting and connecting electrical devices having pin outputs is formed of a lid and a boxed-shaped bottom part. The lid has a plurality of holes arranged in pairs for receiving pins, while the bottom part has a hollow opposite each pair of holes for receiving a connecting element formed with pairs of tongues for detachable locking contact elements inserted from the lower side of the bottom part. Between rows of pairs of holes on the top part are three holes arranged in a vertical row, opening into a recess in the bottom

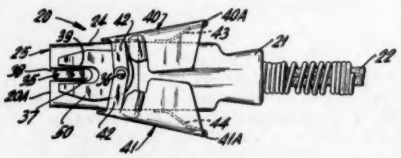
side of the bottom part. A short-circuiting device insertable into the recess has a pair of contacts for receiving pins inserted through the two outermost of the three holes and a movable short-circuiting contact engageable by a pin passing through the central hole.

3,594,691
METHOD AND MEANS FOR CONNECTING CABLE SHIELDING
Ronald G. Neal, de Kalb, Ill., assignor to Anaconda Wire and Cable Company
Filed Aug. 11, 1969, Ser. No. 848,804
Int. Cl. H01r *9/08, 11/00, 15/12*
U.S. Cl. 339—29 **6 Claims**



A metal strip connector with a convex pronged surface is inserted under the shielding of a cable, pulled forward to cause the prongs to pierce the shielding and the free end folded back over the jacket and bound down, thus locking the prongs in their piercing position. The extreme free end of the connector is formed into a loop that is pressed onto the flexible conductor of a harness.

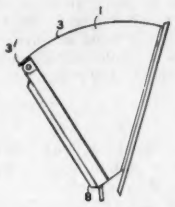
3,594,692
EXPANDABLE ELECTRIC PLUG ADAPTER
George W. Oakes, Crystal City, Mo.
Filed June 9, 1969, Ser. No. 831,365
Int. Cl. H01r *29/00*
U.S. Cl. 339—32 **6 Claims**



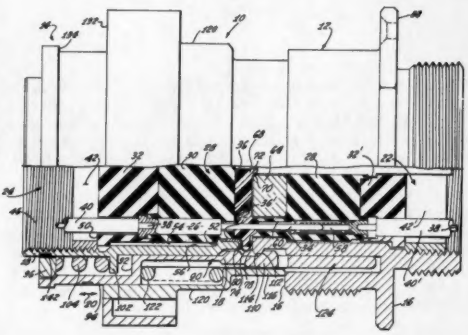
An electric plug adapter mating with a complementary electric service cord plug to form a strong unitary-type construction and having expandable sockets to accommodate various sized and positioned appliance electrode prongs to form positive electrical contact therewith including improved means for facilitating disengaging and engaging the adapter to the appliance electrodes.

3,594,693
WATERPROOF ELECTRICAL CONNECTION BOX COVER
Alfred Robbins, 80 E. Gates Avenue, Lindenhurst, N.Y.
Filed Dec. 22, 1969, Ser. No. 887,276
Int. Cl. H01r *13/44*
U.S. Cl. 339—44 R **4 Claims**

An outdoor electrical connection box cover which is protected against rain and snow. The cover is mounted on a conventional junction box mounted in a wall. The face of the cover containing the electrical sockets is angled down at a substantial angle and the cover has a hood or shield to protect the face from rain and snow. Snap-type covers are mounted over the electrical sockets.

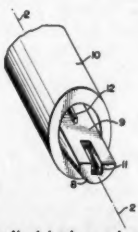


3,594,694
QUICK DISCONNECT CONNECTOR
Thomas A. Clark, Mountain View, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.
Filed Nov. 8, 1968, Ser. No. 774,347
Int. Cl. H01r *13/54, 13/62*
U.S. Cl. 339—45 M **15 Claims**



A fluidtight electrical connector is disclosed herein which has a lock for releasably securing a pair of mating sections together. The lock is adapted to secure the sections together when a first portion thereof is axially moved a predetermined distance in the direction of engagement, and to unlock the connector sections and cause them to separate when a second portion thereof is axially moved a predetermined distance opposite the direction of engagement. The connector includes means for producing a consistent interface pressure between the connector sections and means for indicating when the electrical terminals of the locked connector sections are not in complete engagement.

3,594,695
HERMAPHRODITIC ELECTRICAL CONNECTORS
Delbert R. Wofford, Owensboro, Ky., assignor to Texas Gas Transmission Corporation, Owensboro, Ky.
Filed Feb. 12, 1969, Ser. No. 798,738
Int. Cl. H01r *13/62, 25/00*
U.S. Cl. 339—49 **7 Claims**



An elongated semicylindrical or plate insulating member has disposed along it in two different positions along the

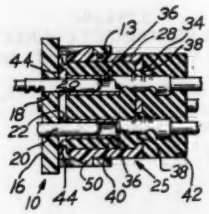
length contacts comprising a male and a female plug connector so that two similar members can be slid together longitudinally along mating surface portions to contact and register the plug connectors. Locking means is provided to hold the connectors in place. The male contact is protected from damage by an enveloping hood and the protruding insulating member portion has a female contact so that the contact surfaces are not easily touched or damaged.

3,594,696

ELECTRICAL TERMINAL CONNECTOR

Roman J. Witek, Jr., Romulus, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed June 21, 1968, Ser. No. 738,875
Int. Cl. H01r *13/52, 13/54*
U.S. Cl. 339—60 **7 Claims**



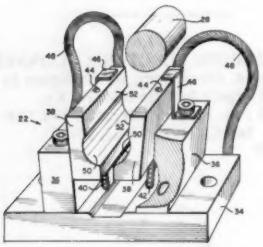
A connector including a terminal carrying block housing having a one or more electrical terminals mounted therein and a plug. The plug is adapted to be inserted in the block housing and includes a relatively rigid housing closed at one end by a wall, the rigid housing being latched into the block housing. One or more electrical terminals are inserted through an aperture in the wall and are fixed in place in the plug housing by being embedded in a soft resilient moulded mass which fills the plug housing, the plug terminals being adapted to mate with the block housing terminals. The unitary resilient mass extends beyond one end of the plug housing to form a resilient sealing lip which surrounds the plug terminals and seals the plug against the block housing.

3,594,697

ELECTROPLATING TANK SADDLE

Wendell Azbell, 2877 Streamside Drive, Columbus, Ind.

Filed Nov. 1, 1968, Ser. No. 772,697
Int. Cl. H01r *13/62*
U.S. Cl. 339—64 R **12 Claims**



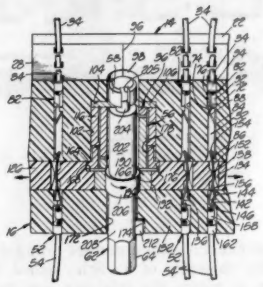
An electroplating tank saddle for supporting, and making electrical contact with, the support bar on which racks of parts to be plated are carried. The saddle has jaws which are spring pressed to upwardly open position to receive a support bar, and which close in response to the weight of such bar and its load to grip the support bar and make good electrical conductive engagement therewith. The jaw mounting permits the jaws to tilt or otherwise adjust themselves to accommodate misalignment commonly resulting from bending of the support bar under its load and from bending of the tank rim on which the saddle is mounted. The good electrical contact provided by the saddle under practical conditions improves the plating operation and reduces the reject rate.

3,594,698

LOW INSERTION FORCE CONNECTOR ASSEMBLY

John W. Anhalt, La Crescenta, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 30, 1969, Ser. No. 837,400
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 M **5 Claims**



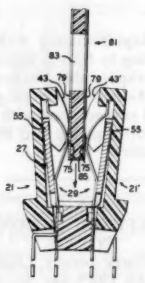
An electrical connector assembly having a low insertion force upon mating of a first connector member and a second connector member. Each of the connector members contains contacts mounted in bores formed therein. The contacts of one of the connector members extends forwardly from the bore. A split insulator member in one of the connector members forms a pair of actuating plates with centrally mounted drive for moving the actuating plates in opposite directions. The actuating plates move the contacts of the connector in which it is mounted so as to mate the contact surfaces of the connector members. The centrally mounted drive may comprise a shaft member having an actuating cam mounted on it which, upon rotation of the shaft, causes a cam bearing to be displaced. Further, the shaft member may have a polarizing device mounted thereon coaxial with the shaft for engagement with a polarizing device on the other connector.

3,594,699

ARTICULATED PRINTED CIRCUIT EDGE CONNECTOR

Max L. Jayne, North Warren, and Gregory C. Yehl, Warren, both of, Pa., assignors to Sylvania Electric Products, Inc.

Filed Dec. 15, 1969, Ser. No. 885,047
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 MP **10 Claims**



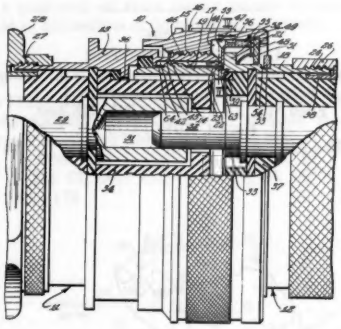
A printed circuit edge connector having an insulating body comprising two opposing members mating at their respective

base portions with a longitudinal spacing member, and at their respective upper portions with the upstanding sides of a U-shaped spring, thereby forming a channel for receiving the edge of a printed circuit board, and making it possible to assemble and disassemble the entire connector while the metallic contacts whose upper portions are retained within the connector and whose lower portions are retained in established positions within a board upon which the connector is mounted are allowed to remain in this established relationship, making it possible to replace one or more of these contacts without having to remove all of them.

3,594,700
ELECTRICAL CONNECTOR WITH THREADED COUPLING NUT LOCK

Jopseh A. Nava, Villa Park, and Charles W. Smaczny, Chicago, both of, Ill., assignors to The Pyle-National Company, Chicago, Ill.

Filed Aug. 20, 1969, Ser. No. 851,543
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 R **13 Claims**



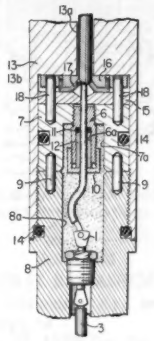
An electrical connector comprising a pair of telescopically assembled parts for joining axially aligned male and female conductors and having a coupling nut threaded onto one of the parts and engaging portions of the other part for coupling the interfitted parts in an assembled relationship, wherein resilient locking means are interposed between the coupling nut and the pair of parts for restraining uncoupling movement of the nut and for producing an audible sound indicating proper joinder of the parts.

3,594,701
SEAL FOR WELLBORE INSTRUMENT

Terry Leroy Ramsey, and Reginald G. Ford, both of Tulsa, Okla., assignors to Cities Service Oil Company, Tulsa, Okla.

Filed June 6, 1968, Ser. No. 735,052
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 R **9 Claims**

The electrical connection between a downhole wellbore instrument and a single conductor is isolated from the wellbore environment by a sealing mechanism in which a pressure-deformable sealing ring is pressed into sealing contact with the conductor. The sealing ring is positioned in a packing gland affixed to a supporting block. A locking nut is removably secured to the packing gland. As the locking nut is secured to the packing gland, an annular ring positioned on the locking nut is moved inwardly in an opening in the packing gland, said packing ring establishing pressure contact with the sealing ring as the locking nut approaches its fully secured position. The pressure of the annular pressure ring upon the ring causes the sealing ring to deform so as to fill the seat in the packing gland in which it is positioned and to establish sealing contact with the conductor. The supporting block is affixed to a cable head connector to which the downhole instrument may be removably secured. The cable head connector has an axial opening in the upper portion thereof. The electrical connection and the packing gland are located in the space confined by the cable head connector and the supporting block attached thereto. An outer enclosing block, which is removably secured to the cable head connector, has an annular opening therein through which the conductor passes and in which the supporting block and the packing gland are positioned. Sealing means are provided

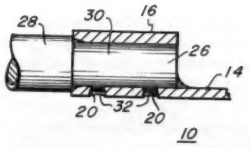


between the outer enclosing block in both the cable head connector and the supporting block so as to prevent ingress of well fluids into the space confined by the cable head connector and the supporting block along the point of contact between these two members.

3,594,702
CONNECTOR

William G. Frey, Union, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed July 31, 1969, Ser. No. 846,426
Int. Cl. H01r *11/20*
U.S. Cl. 339—95 R **15 Claims**



A connector for coupling an electrical conductor to a terminal comprising a wire barrel arranged to be mechanically deformed about the portion of an electrical conductor from which the insulation has been removed to provide an electrical and mechanical connection therewith and a terminal-engaging means coupled to said wire barrel. A plurality of apertures extend through the wire barrel to permit the extrusion of adjacent portions of the metal of the conductor into such apertures to improve the mechanical and electrical coupling therewith. Further, the apertures will permit the breakdown of surface oxides to insure a good electrical connection with the conductor. An insulating jacket may be placed atop the wire barrel and deformed portions of the insulating jacket will also penetrate the apertures to securely, mechanically lock the jacket to the wire barrel.

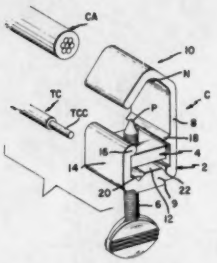
3,594,703
ELECTRICAL TAPOFF CONNECTOR

Clyde Norman Holtzapple, Duncannon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

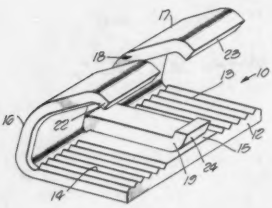
Filed Oct. 13, 1969, Ser. No. 865,836
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 R **24 Claims**

A tapoff connector adapted to be secured to existing line cables and further adapted to receive lead wires from street lights or other electrical devices is disclosed. The connector has insulation-piercing screw means which, when tightened onto an insulated line cable, pierces the insulation of the

cable and mechanically and electrically engages the conductor thereof. Means are provided in the connector whereby the conductors of tap wires are gripped and held in another portion of the connector when the screw is tightly in place on the line cable. Electrical current is then transmitted from the line cable to the tap wires via the connector. Alternate embodiments are also shown, one of which includes a connector which may be secured to prestripped insulated line cable.



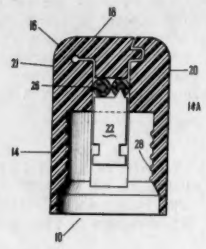
3,594,704
IN-LINE CONNECTOR FOR ELECTRICAL CONDUCTORS OR THE LIKE
Christopher L. Fischer, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Filed Oct. 2, 1969, Ser. No. 863,132
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 **3 Claims**



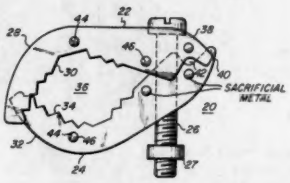
A connector for making an in-line electrical connection between two or more insulated electrical wires or conductors in which a pair of spaced teeth on an upper jaw member cooperate with a tooth positioned on a lower jaw member such that meshing of the teeth cause the conductors to be bent around the lower tooth and the insulation to be stripped therefrom along planes parallel to the planes of movement of the teeth.

3,594,705
LAMP SOCKET
George D. Levy, Jamaica Plain, Mass., assignor to Beacon Electric Manufacturing Co., Boston, Mass.
Filed Sept. 29, 1969, Ser. No. 861,949
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 L **7 Claims**

A socket assembly including a hollow socket housing into which a lamp can be inserted and a set of contacts affixed within the socket housing. The single-piece housing of a yieldable material is adapted for connection to an electric cord.



3,594,706
GROUND CONNECTOR
Tomas Julio Sotolongo, Long Branch, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed May 21, 1969, Ser. No. 826,460
Int. Cl. H01r *13/20*
U.S. Cl. 339—114 **14 Claims**

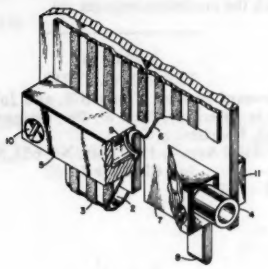


The disclosure is directed to devices for protecting the ground connection between a conduit and a grounding conductor wherein the ground connector, conductor and conduit may be of dissimilar materials. The invention consists of the use of sacrificial metals functionally united with the ground connector in such a manner as to prevent, or greatly minimize, corrosion caused by galvanic action. The ground connector is fabricated, according to the various embodiments of the invention, to contain sacrificial metals placed in the external surface of the connector, placed with the connector, with exposure to the outer surface thereof, or impregnated directly into the connector with access from the outer surface to such sacrificial metal contained therein. The basic concept of operation of the clamp, in each of these configurations is that the electrolyte such as salt water, bathes, at the same time, the connector, the conductor, the conduit and sacrificial metal. The configuration of the connector is so chosen as to facilitate such uniform bathing of the materials involved.

3,594,707
CIRCUIT BOARD WITH FLUID PRESSURIZED INSERT STRIP
William Donald Peterson, II, 1996 E. 4675 South, Salt Lake City, Utah
Filed Oct. 20, 1969, Ser. No. 867,655
Int. Cl. H01r *33/82*
U.S. Cl. 339—17 L **2 Claims**

An electronic circuit board having a collapsible insert strip with a sealed pressurizable pocket between the insert strip conductors, by varying the amount of fluid in the pocket

being able to contract thinner for insertion into a connector and expanding thicker to make electrical contact. A system



having a multitude of these circuit boards to connect to a multitude of connectors of an electronic assembly.

3,594,708

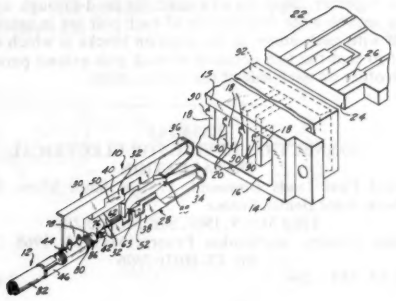
PRINTED CIRCUIT BOARD COAXIAL CONNECTOR

Guy John Lalonde, Bethpage, N.Y., assignor to Industrial Electronic Hardware Corp., New York, N.Y.

Filed Mar. 5, 1969, Ser. No. 804,565

Int. Cl. H01r *13/34, 5/08;* **H05k** *1/07*

U.S. Cl. 339—176 **24 Claims**



A connector for use in connecting a coaxial cable or shielded wire conductor to a printed circuit board comprises a pair of contacts. One contact is adapted to be crimped about the inner signal conductor of the coaxial cable, and the other contact is adapted to be crimped to the braid or shielded wire of that cable. The two contacts are secured to an insulator by means of securing parts extending from each contact and received in spaced slots formed in the insulator.

3,594,709

ELECTRIC SERIES TERMINAL

Hans Woertz, Basel, Switzerland, assignor to Messrs. Oskar Woertz, Inh. H. & O. Woertz, Basel, Switzerland

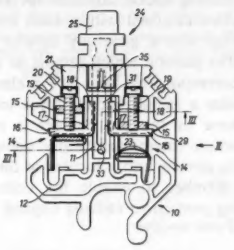
Filed Dec. 11, 1968, Ser. No. 783,020

Claims priority, application Switzerland, Feb. 13, 1968, 2,135/68

Int. Cl. H01r *9/00*

U.S. Cl. 339—198 **8 Claims**

An electric series terminal having a releasable and insertable isolating plug with an insulated grip portion and a metallic contact portion. The plug has two connecting devices for



electric conductors and the terminal itself comprises an insulating body with various contacting parts therein.

3,594,710

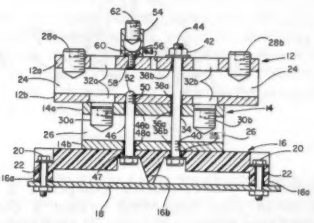
NEUTRAL BAR ASSEMBLY

Harris I. Stanback, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.

Filed Jan. 27, 1970, Ser. No. 6,172

Int. Cl. H02r *9/00*

U.S. Cl. 339—198 **11 Claims**



A system of components which can be grouped into sets for assembly in various configurations to provide electrical neutral bar assemblies of different shapes and having different numbers of neutral-wire-receiving openings. The system, which is particularly suitable for use with neutral wires of relatively large ampacity, includes a plurality of insulating bases, a plurality of neutral bars of different lengths, and an interconnecting plate. One or more of the bases and one or more of the neutral bars with or without the interconnecting plate are arranged to be secured together in different configurations by bolts.

3,594,711

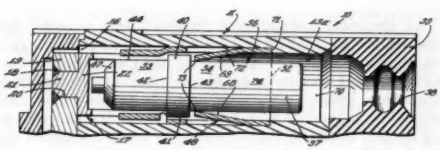
TERMINAL BLOCK

Joseph A. Nava, Villa Park, and Charles W. Smaczny, Chicago, both of, Ill., assignors to The Pyle-National Company, Chicago, Ill.

Filed Apr. 3, 1969, Ser. No. 813,247

Int. Cl. H01r *7/12*

U.S. Cl. 339—198 **11 Claims**



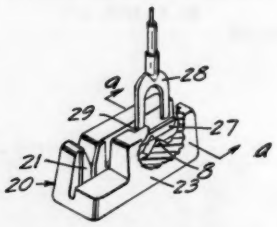
A terminal block for receiving and electrically interconnecting a plurality of pin contacts. The pin contacts are in-

serted into bores formed in the body of the terminal block and the forward or nose portions thereof are telescopically received in mating socket contacts securely disposed within the bores. Also disposed within each bore is a sheet-form member rolled into a generally tubular configuration and having a collet portion which retains its respective pin contact in its corresponding bore and a clamping ring portion which provides a radial reactive force to its socket contact when the nose of the pin contact is inserted therein. A bridging portion interconnects the collet portion and the clamping ring portion and is located at the neutral axis of the sheet-form member to enable the collet portion and the clamping ring portion to radially expand and contract independently of one another.

3,594,712
CONNECTOR

Dennis J. Enright, and Leonard H. Schrenkler, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 7, 1968, Ser. No. 774,027
Int. Cl. H01r *9/08, 9/12*
U.S. Cl. 339—221 **9 Claims**

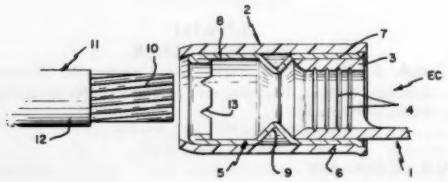


A solderless wire-connector comprises a slotted thin resilient metal plate supported against a correspondingly slotted rigid base having a wire cutoff anvil surface.

3,594,713
ELECTRICAL CONNECTOR

Woodrow William Thoman, Glen Rock, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of application Ser. No. 878,115, Nov. 19, 1969, now abandoned. This application Mar. 6, 1970, Ser. No. 17,238
Int. Cl. H01r *15/12*
U.S. Cl. 339—223 **1 Claim**



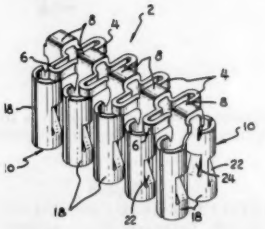
An electrical connector is provided with a sleeve having one section secured on a wire-crimping section of a contact member and another section extending outwardly from the wire-crimping section which has an inwardly directed annular projection having a V-shape in cross section. The annular projection is located adjacent an entrance to the wire-crimping section to define funnel means to guide a stripped end of an electrical conductor within the wire-crimping section. The annular projection has a diameter less than the diameter of the wire-crimping section to provide stop means against which the insulation engages to prevent the conductor from being improperly positioned in the connector prior to the connector being crimped to the conductor.

In a modification of the invention the wire crimping section is deformed to form a projection extending axially along the wire-crimping section. This projection provides a stop against which the insulation engages.

3,594,714
TERMINAL STRIP

Clarence Leonard Paullus, Camp Hill, and John Aaron Zimmerman, Jr., Hershey, both of, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 4, 1967, Ser. No. 658,368
Int. Cl. H01r *13/12*
U.S. Cl. 339—242 **11 Claims**

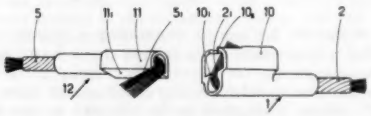


Terminal strip for use in an interconnection system comprises two spaced-apart parallel carrier strips connected together by transversely extending rungs. Contact sockets are integral with the carrier strips on opposite sides of the rungs and extend laterally therefrom. Portions of terminal strip extending between rungs are folded to shorten the pitch of the strip and adapt it for use in housings in which contacts are close together. Strip may be used for feed-through applications, in which the two sockets of each pair are in axial alignment with each other, or for junction blocks in which strip is bent so that the two contacts of each pair extend parallel to each other on each side of the carrier strips.

3,594,715
CONNECTION DEVICE FOR ELECTRICAL INSTALLATION

Gerard Paul Louis Dumesnil, 17 Rue Saint Marc, Epinay (Seine Saint Denis), France

Filed May 9, 1969, Ser. No. 823,288
Claims priority, application France, May 22, 1968, 152843
Int. Cl. H01r *7/06*
U.S. Cl. 339—244 **9 Claims**



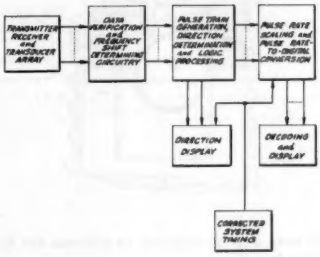
The invention relates to a connection device which can be used to make connections, either between a wire and a terminal, or between two wires, said device being composed of a dielectric pressed part bearing a guide allowing the nesting of the end of one of the two wires to be connected to a terminal or to another wire, said guide being fitted with a parallel sleeve, the cross section of which is identical to that of the plug or the pin secured to the end of the other wire to be connected with, in such way that the bare end of the wire inserted into the guide of the device will be allowed to be folded over at 180° so as to get housed in its sleeve, the plug or terminal being then inserted in said sleeve in such way as to come in contact with the bare wires, thus providing the electrical connection between the two wires.

3,594,716

ELECTRONIC DOCKING GUIDANCE SYSTEM

Glenn N. Waterman, Salt Lake City, Utah, assignor to Edo Western Corporation, Salt Lake City, Utah

Filed Apr. 24, 1969, Ser. No. 818,893
Int. Cl. G01s 9/66
U.S. Cl. 340—3 D 17 Claims


TRANSMITTER RECEIVER AND TRANSDUCER ARRAY
CLOCK FURNISHING R-F FREQUENCY SHIFT DETERMINING CIRCUITRY
PULSE TRAIN GENERATION, DIRECTION DETERMINATION AND LOGIC PROCESSING
PULSE RATE SCALING AND PULSE RATE-TO-DIGITAL CONVERSION
DIRECTION DISPLAY
DECODING AND DISPLAY
CONNECTED SYSTEM TIMING

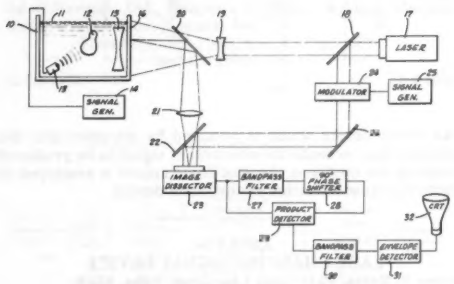
A vessel docking system employs transmitting and receiving transducers for developing Doppler frequency shifted signals indicative of velocity components along particular ship's axes. The signals are converted to digital form, and processed to yield speed and direction information along the sensed axes. The velocity information is corrected to compensate for variations in the acoustical propagating characteristic of the ocean medium.

3,594,717

SONIC TRANSDUCER

Albert Macovski, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Oct. 7, 1969, Ser. No. 864,351
Int. Cl. H04b 11/00; G01n 29/04
U.S. Cl. 340—5 H 6 Claims



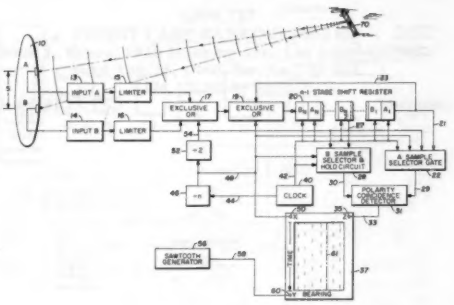
An object is acoustically illuminated and the acoustic image of the object is incident on and deforms an elastic surface. The elastic surface is illuminated with a first portion of light from a coherent source whereby the light is scattered to form an object beam. A second portion of the light from the coherent source is cyclically temporally offset by a modulator to form a modulated reference beam. The object and modulated reference beams are combined to form a light interference pattern which is optically scanned by an electron beam of an image dissector. The interference pattern and the electrical signal derived therefrom by the image dissector contain information relating to incidental variations in the elastic surface as well as the desired image vibrational signal. Electrical detectors and filters separate out the desired image vibrational signal which is applied to a cathode-ray tube for viewing. Alternatively, the cathode-ray tube display may be recorded on a photosensitive surface to create a holographic transparency which, when illuminated with coherent light, produces a hologram.

3,594,718

SHIFT REGISTER TIME COMPRESSOR FOR SONAR SIGNAL CORRELATION

Charles I. Black, and Ralph M. DuVall, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1966, Ser. No. 606,210
Int. Cl. G01s 3/00
U.S. Cl. 340—6 R 7 Claims



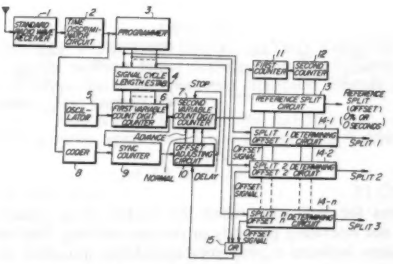
Successive signal samples from one detecting station are each compared for polarity coincidence with all samples in a train of samples of signals from a second detecting station with visual display means provided for integration with time. New samples of signals from both detecting stations are injected into the system at controlled sample rates synchronized with the display unit.

3,594,719

SYSTEM OF CONTROLLING TRAFFIC SIGNALS

Tadao Endo, Kyoto, and Tosiaki Arima, Otokuni-gun, both of, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed June 3, 1969, Ser. No. 829,968
Claims priority, application Japan, June 20, 1968, 43/42228
Int. Cl. G08g 1/07
U.S. Cl. 340—40 8 Claims

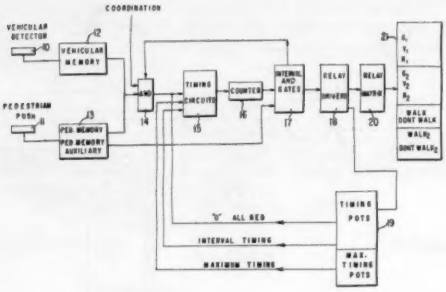


A coordinated traffic signalling control system comprises a plurality of local controllers having no interconnecting cables. Each controller includes a radio receiver tuned to receive a standard frequency and time transmission, broadcast by a preexisting standard signal services station, such as WWV; and a time signal discriminator coupled to the receiver generates time signals from the received radio signals. A programmer circuit, responsive to the generated time signals, in turn generates traffic pattern instruction signals. Circuits responsive to the generated timing signals and to the generated pattern instruction signals, automatically control the offset and split selection for that controller.

3,594,720
SOLID-STATE TRAFFIC CONTROLLER

Philip Cane, Brooklyn, N.Y., assignor to The Marbelite Company, Inc., Brooklyn, N.Y.

Filed Jan. 31, 1968, Ser. No. 702,012
Int. Cl. G08g 1/09, 1/08
U.S. Cl. 340—44 9 Claims

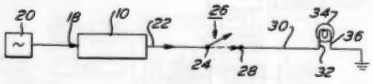


A controller for traffic lights employing solid-state components and providing both vehicular and pedestrian control. Cross street controls initiate operation of a binary counter sequentially to operate signal lights through predetermined time intervals. Interconnecting circuits provide for coordination with other signal lights, vehicle extension intervals, recall and resetting controls. An auxiliary memory circuit operates to distinguish between vehicle only and pedestrian operation.

3,594,721
VEHICLE BRAKE CONDITION AND OPERATION DETECTING SYSTEM

Amotz Frenkel, Lansdale, and Michael Robert Nakonechny, Valley Forge, both of, Pa., assignors to Transducer Systems, Inc., Willow Grove, Pa.

Filed July 18, 1969, Ser. No. 842,844
Int. Cl. B60q 1/00, 5/00
U.S. Cl. 340—52 A 10 Claims



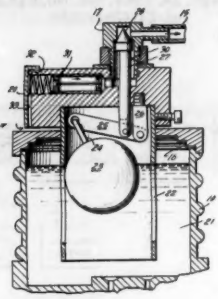
Means for indicating when the brakes of a vehicle are either not operating properly or require relining. The indicator means includes a proximity transducer mounted on the brake shoe and connected to a warning device in the vehicle so as to notify the operator either when the brake shoe does not operate properly or when the lining on the brake shoe becomes too thin and requires replacing.

3,594,722
SIGNALING APPARATUS

William F. Shultz, P.O. Box 55, Gotha, Fla.

Filed Nov. 21, 1968, Ser. No. 777,595
Int. Cl. B60t 17/22; G01f 23/08
U.S. Cl. 340—59 9 Claims

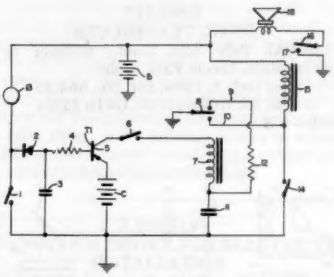
A safety warning apparatus for signaling when vehicle fluids, such as brake and power steering fluids are low. The system operates off of the manifold vacuum and may operate audibly as well as visually to alert the operator of potential hazards and may also be adapted to activate the brake lights when the vehicle stalls.



3,594,723
ALARM DEVICE

George Puig, 141 Salven St., Rio Piedras Heights, Rio Piedras, P.R.

Filed May 31, 1968, Ser. No. 733,360
Int. Cl. G08b 13/00; B60r 25/00
U.S. Cl. 340—63 R 10 Claims

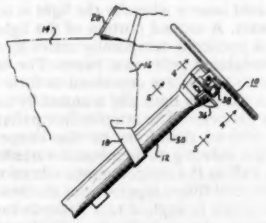


An alarm device which is actuated by intrusion into the protected area to cause an intermittent signal to be produced indicating the intrusion. An electronic circuit is employed to selectively cause actuation of the alarm device.

3,594,724
LANE CHANGING SIGNAL DEVICE

George A. Evers, 1015 State Line Road, Niles, Mich.

Filed Dec. 1, 1964, Ser. No. 415,040
Int. Cl. B60q 1/26
U.S. Cl. 340—81 5 Claims



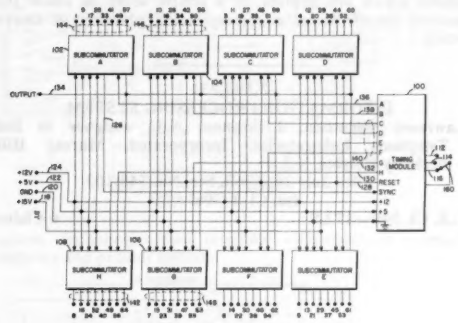
The present invention relates to a signal for automobiles and more particularly to a signal device for indicating the driver's intention to change highway lanes.

3,594,725

INTERLACED ELECTRONIC COMMUTATOR HAVING PLURAL SUBCOMMUTATORS

Glenn G. Clinard, Upland, Calif., assignor to General Dynamics Corporation

Filed Nov. 4, 1968, Ser. No. 773,111
Int. Cl. H04q 5/00
U.S. Cl. 340—147 10 Claims



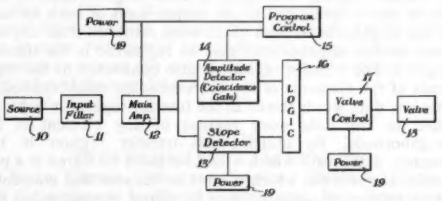
An interlaced electronic commutator system having use in a time division multiplex system. A timing circuit and a plurality of subcommutator circuits are employed, each one of which periodically gates input data for a relatively long period of time, isolates the gated input data, then gates only the last portion of the isolated input data as the subcommutator output. The outputs of all the subcommutators are then combined in a high rate pulse amplitude modulated waveform.

3,594,726

PROGRAMMED SLOPE AND AMPLITUDE RESPONSIVE SYSTEM

William M. Fleisher; Paul W. Kercher, and Ralph M. Nester, all of Newark, Del., assignors to Nester & Faust Manufacturing Corporation, Newark, Del.

Filed Sept. 30, 1968, Ser. No. 763,562
Int. Cl. H04q 9/00
U.S. Cl. 340—149 11 Claims



A system is provided for interpreting a variation in voltage or current at any stage of the variation. The stage at which any variation is to be detected is predetermined by a program control. In the system is a slope detector that sends signals which are measures of the voltage or current, and there is an amplitude detector which sends similar signals, the various signals being received by a logic center which also receives signals from the program control. Upon the proper coincidence of the three signals the logic center sends directive signals to an electrical circuit and this then activates or deactivates an element as desired.

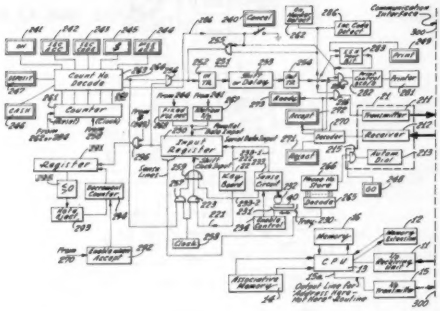
As relating to gas chromatography, the signals coming from a dual thermal conductivity cell are followed in a manner in which the operator knows whether, at a given time, the elution curve is on the positive or negative side or at the peak or unchanging and precisely where it is, or in other words, the amplitude. The operator who wishes to collect the sample being eluted only between two points sets the program control and the slope detector and the amplitude detector to feed the electrical signals to the logic center so that it becomes active precisely at the start of the collection to open a valve and becomes active precisely at the end of the collection to close the open valve. During the time the valve is open the sample desired is being collected in a proper container which is in conduit relationship with the valve. With the respective valve closed, the unwanted material is vented.

3,594,727

CREDIT CARD BANKING SYSTEM

Edward L. Braun, 1920 Manning Ave., Los Angeles, Calif.

Filed Apr. 16, 1968, Ser. No. 721,681
Int. Cl. H04q 9/00
U.S. Cl. 340—152 25 Claims



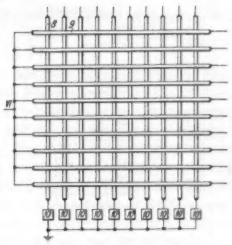
A system is disclosed in which one or more central stations can communicate with peripheral stations as to information held or controlled by the central station for access by authorized users only. The central station verifies the existence of paired codes in a memory bank of the central station when set into a peripheral station, before permitting access. Specifically, accounts are kept secure in this manner, permitting reduction of credit balance or increase of debit balance only to those in possession of the paired code associated with the account. Verification permits transfer of commodities or services at the location of the peripheral station with immediate updating of the centrally stored account balance. Various types of input and output devices as controlled by a peripheral station are disclosed.

3,594,728

DOUBLE INJECTION DIODE MATRIX SWITCH

John Lytollis, and Ian James Saunders, both of London, England, assignors to International Standard Electric Corporation, New York, N.Y.

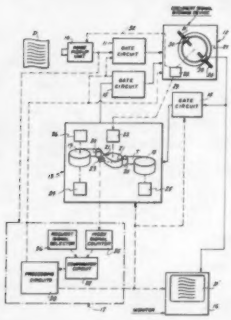
Filed Aug. 3, 1967, Ser. No. 661,754
Claims priority, application Great Britain, Aug. 9, 1966, 35521/66
Int. Cl. H01j 39/12
U.S. Cl. 340—166 11 Claims



A cross-point switch utilizing opto-electronic switches at the cross-points. The switches can be a plurality of double-in-

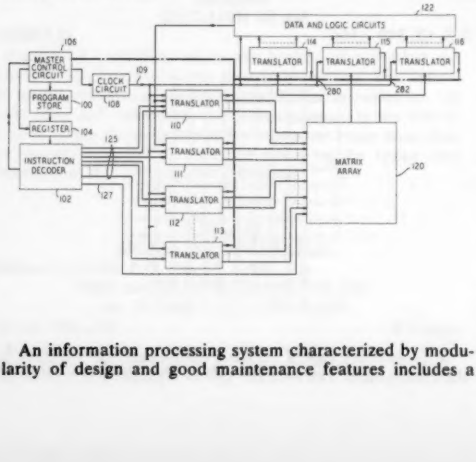
jection diodes formed from a common body of semiconductive material. Various constructions and materials are used for the cross-point switches. A number of ways of illuminating the individual diodes discretely are shown together with different ways of switching the light from one diode to another.

3,594,729
DATA RETRIEVAL SYSTEM
Saburo Uemura, Yokohama-shi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 19, 1967, Ser. No. 691,787
Claims priority, application Japan, Dec. 19, 1966, 41/83365
Int. Cl. G11b *5/02*
U.S. Cl. 340—172.5 **8 Claims**



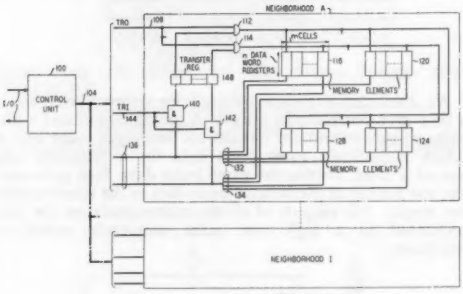
In a data retrieval system employing a magnetic tape or other recording medium having index signals at intervals therealong for identifying respective tape portions and being moved past a head which is cyclically displaced to scan stripelike areas extending across the tape, the tape is driven at a high speed to rapidly bring a selected index signal near to the head and then the movement of the tape is continued at a low speed at which a plurality of the areas scanned by the head are in overlapping relation, and the head is operated to record or reproduce data signals only during one of its cyclical displacements upon the selected index signal reaching a predetermined position in the course of the continued low speed movement of the tape.

3,594,730
INFORMATION PROCESSING SYSTEM INCLUDING MULTIPLE FUNCTION TRANSLATORS
Wing N. Toy, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed June 7, 1968, Ser. No. 735,297
Int. Cl. 3-G06f *5/00*
U.S. Cl. 340—172.5 **11 Claims**



An information processing system characterized by modularity of design and good maintenance features includes a plurality of one-out-of-N translators each of which includes double-output detection circuitry. Some of the translators are operated in a conventional manner to convert a multidigit input word into energization of one particular one of N output lines emanating therefrom. Others of the translators are supplied with periodic clock signals, steady-state reference signals and instruction signals. In response to such a set of signals, these other translators are operated in a unique manner to provide a specified plurality of sequential control signals which are applied to a matrix array to cause the readout therefrom of a corresponding plurality of stored words.

3,594,731
INFORMATION PROCESSING SYSTEM
Lawrence Bernstein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed July 26, 1968, Ser. No. 748,103
Int. Cl. 3-G06f *3/00*
U.S. Cl. 340—172.5 **6 Claims**

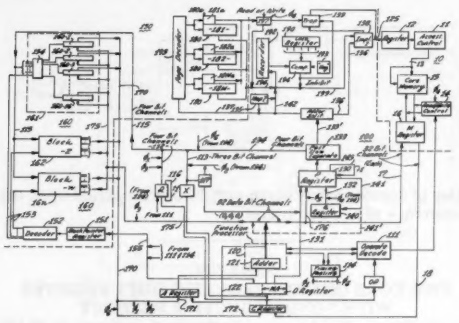


An arrangement for enabling the transfer of data words from any data word register in any element of a neighborhood of elements of an associative memory system to any other data word register in any element of the neighborhood. Each element comprises a plurality of data word registers. The neighborhoods, in turn, comprise a plurality of elements. A transfer register is located in each neighborhood of elements and is connected to the output leads of each element of the neighborhood such that a word retrieved from any element in that neighborhood may be registered in the transfer register. The transfer register is also connected to the input leads of the elements of the corresponding neighborhood so that any data words stored in the transfer register may be applied to any data word register of any element in the neighborhood. By utilizing the transfer register in this manner, data words which would normally be stored in a particular element but which cannot be because that element is being utilized to capacity, may be stored in some other element of the neighborhood, and then transferred to the first mentioned element when the data word is needed, for example, in a computation by the first element.

3,594,732
GENERAL PURPOSE DIGITAL COMPUTER
Myron J. Mendelson, Encino, and Alfred W. England, Reseda, both of, Calif., assignors to Scientific Data Systems, Inc., Santa Monica, Calif.
Continuation of application Ser. No. 572,835, Aug. 16, 1966, now abandoned. This application Oct. 29, 1969, Ser. No. 872,430
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **24 Claims**

The application discloses a general purpose digital computer having a fast access, register-type memory and a relatively slow access, core memory. The fast memory is divided into blocks selectively operable as accumulator extension

and indexing registers or as memory. The computer is provided with a programmable and controllable interrupt



system. including nested interrupt operations, a memory mapping and protect system.

3,594,733

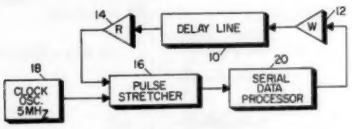
DIGITAL PULSE STRETCHER

George B. Lukens, II, Waynesboro, Va., assignor to General electric Company

Filed Feb. 24, 1969, Ser. No. 801,557

Int. Cl. G06f *13/02, 1/04*

U.S. Cl. 340—172.5 **11 Claims**



A digital signal processing arrangement involving pulse forming and timing. A digital pulse stretcher synchronizes the output of an asynchronous pulse source with a synchronous digital frequency source. The pulse stretcher includes a first flip-flop which is set until the asynchronous pulse arrives. Arrival of the asynchronous pulse resets the first flip-flop and simultaneously sets a second flip-flop. A third flip-flop is set until the synchronous pulse arrives at which time the third flip-flop resets. As the end of the synchronous pulse the second flip-flop resets, causing the third flip-flop to return to the set state. A triggered output flip-flop is also included and operates to release the output of the second flip-flop at the beginning of the next bit time.

3,594,734

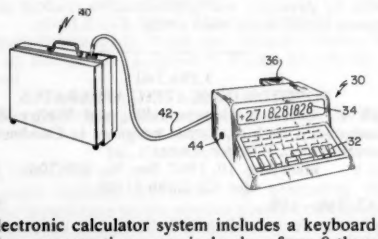
PROGRAMMABLE CALCULATOR

An Wang, Lincoln, Mass., and Prentice I. Robinson, Hudson, N.H., assignors to Wang Laboratories, Inc., Tewksbury, Mass.

Filed Mar. 21, 1969, Ser. No. 809,251

Int. Cl. G06f *3/06, 3/10*

U.S. Cl. 340—172.5 **15 Claims**



An electronic calculator system includes a keyboard unit having keys representing numerical values from 0 through 9 and additional keys representing instruction values. Logic responsive to key operation produces codes for numerical values and instruction values; these codes function to determine operations performed by the calculator. The system further includes a magnetic tape unit operable in either of two modes: a learn mode in which key actuation causes the codes to be recorded in predetermined sequence upon a loop of magnetic tape, and a normal mode in which the tape unit senses the codes upon the tape and produces signals responsive to the codes to control calculator operation.

3,594,735

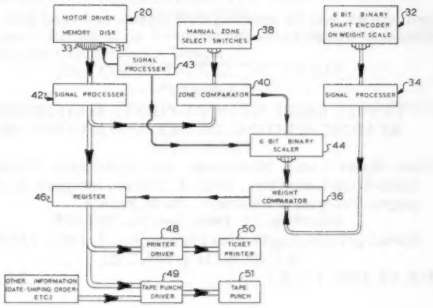
DATA RETRIEVAL APPARATUS

James H. Furlong, and Carl V. Phillips, both of Columbus, Ohio, assignors to The Exact Weight Scale Company, Columbus, Ohio

Filed Aug. 26, 1968, Ser. No. 755,352

Int. Cl. G11c *13/04*

U.S. Cl. 340—173 LM **5 Claims**



An apparatus for the retrieval of prestored information which incorporates a novel data storing means in the form of a rotatable disc provided with an optically sensed code wherein the code is nonanalogous to shaft position. The apparatus also includes means for creating optical signals responsive to the code on the disc and means for sensing and converting the optical signals into electrical signals. Certain of these electrical signals are compared with predetermined reference signals for locating the desired data on the disc for retrieval upon appropriate command.

3,594,736

MOS READ-WRITE SYSTEM

Charles R. Hoffman, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

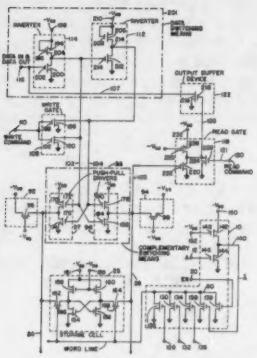
Filed Nov. 29, 1968, Ser. No. 779,727

Int. Cl. G11c *11/40;* **H03k** *3/286*

U.S. Cl. 340—173 FF **10 Claims**

Disclosed is a MOS read-write system for reading the binary content of a MOS storage cell and for writing into the storage cell. The system includes cross-coupled MOS devices which are connected to bit lines leading into the MOS storage cell, and these MOS devices or drivers are connected in push-pull and are conductively controlled by data and read and write command signals. The MOS devices are connected to write inverters for receiving a write command signal and to data inverters for receiving data input signals. A MOS read gate is connected between the MOS devices and a read command input terminal and is further connected to an input-output data line. The bit lines are isolated from the input-output data line by the read gate, by the MOS switching devices

and by a pair of bit line terminating devices. The storage cell is connected across the pair of bit lines and is interrogated



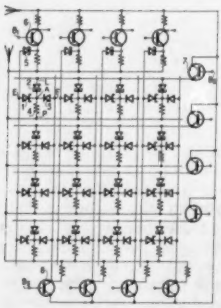
and written into by applying data signals and read and write command signals to the system.

3,594,737

TUNNEL DIODE MEMORY-POINTS MATRIX FOR READING-WRITING, DEVICE AND METHOD OF PRODUCING

Marc Haure-Touze, Montrouge, and Abdelcader Khimeche, Saint-Michel-sur-Orge, both of, France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Dec. 31, 1968, Ser. No. 789,055
Claims priority, application France, Jan. 5, 1968, 135,098
Int. Cl. G11c *11/38, 5/02*
U.S. Cl. 340—173 R **3 Claims**



"Memory elements" matrix for reading-recording device designed in the form of an integrated circuit and enabling nondestructive reading of the data which is recorded there. Each "memory element" comprising a tunnel diode, a unitunnel diode and a normal diode, these three diodes having cathodes composed of the same silicon substrate in which junctions are formed and in which the load resistor of the tunnel diode may also be formed.

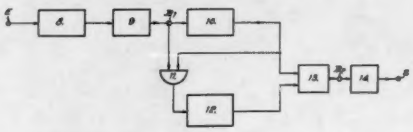
3,594,738

DELAYING READ SIGNAL AS A FUNCTION OF INFORMATIONAL CONTENT

Paul R. Callens, Cagnes sur-Mer (var), France, assignor to I. E. R. Impression Enregistrement Des Resultats, Paris, France

Filed Mar. 21, 1969, Ser. No. 809,204
Claims priority, application France, Mar. 22, 1968, 145,039
Int. Cl. G11b *5/04, 5/44*
U.S. Cl. 340—174.1 H **6 Claims**

Generation of a clock signal by subjecting the read signal to a fixed delay of less than three-fourths of the bit period, preferrably five-eighths of a bit period, in the absence of a midbit transition and subjecting the read signal to a fixed



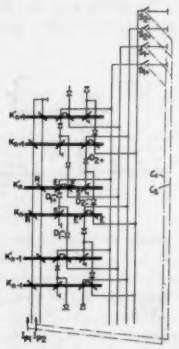
delay of approximately seven-eighths of a bit period upon the occurrence of a midbit transition.

3,594,739

TWO CORE ONE BIT MAGNETIC SHIFT REGISTER WITH NONDESTRUCTIVE READOUT

Munir Bitran, Nussbaumen, Switzerland, assignor to Patelhold Patentverwertungs-& Elektro-Holding AG., Glarus, Switzerland

Filed Oct. 23, 1969, Ser. No. 868,856
Claims priority, application Switzerland, Oct. 24, 1968, 15901/68
Int. Cl. G11c *19/00*
U.S. Cl. 340—174 SR **8 Claims**



A magnetic shift register comprises a chain of main magnet cores and intermediate cores interposed between adjacent main cores, each core having a shift winding, an output winding and two input windings interconnected with each other in the manner of a ring counter and with electronic switching means synchronized with a pair of shift current pulse sources alternately exciting respective shifting windings of the main and intermediate cores in series, to enable a threefold operation of the register of a forward and backward shift of the binary information stored in the main cores to respectively the next succeeding and preceding main cores by two partial shifts via the intervening intermediate cores, and of a combined forward and backward partial shift of the information from each main core to an adjacent intermediate core and back to the main core accompanied by the generation of signals in special readout windings of the intermediate cores suitable for detection and nondestructive readout of the information stored in the main cores.

3,594,740

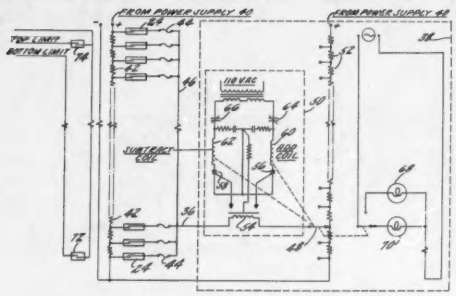
POSITION INDICATING APPARATUS

Joseph H. Comeau, Thompsonville, and Walter H. Zinn, Glastonbury, both of, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 10, 1967, Ser. No. 659,700
Int. Cl. G08b *21/00*
U.S. Cl. 340—188 **7 Claims**

Apparatus for providing an indication of the position of a movable member comprising a magnet which moves with the

member and a plurality of magnetic flux responsive switches individually positioned along a line parallel to the path of movement of the member. A voltage divider electrically connected to the switches provides a signal commensurate with the position of the member to a position indicating device which includes a second voltage divider, a stepping relay and means to indicate the position of the stepping relay.

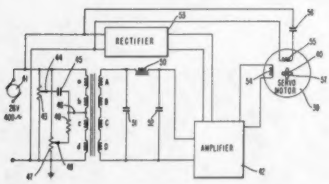


3,594,741

ELECTROMECHANICAL TRANSDUCER

Victor D. Ellison, Waverly, Pa., assignor to The Bendix Corporation

Filed May 29, 1968, Ser. No. 733,127
Int. Cl. G08c *19/44*
U.S. Cl. 340—196 R 9 Claims



An electromechanical transducer comprising a sealed error sensor and followup device having two concentric separately rotatable assemblies constructed to generate an electrical output signal only when one assembly is rotated relative to the other from a predetermined null or neutral position by a wind vane or comparable means. A servomotor is energized in response to the output signal and drives said other assembly through a gear train to cause it to followup and duplicate said relative movement to thus reestablish the null position relationship of the two assemblies. The servomotor may also drive potentiometers, synchros or the like an amount proportional to the movement of said assemblies from a predetermined reference position.

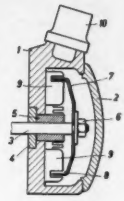
3,594,742

ANGLE STEPPING TRANSMITTERS

Jean-Pierre Reichenbach, Koniz, and Erhard Winkler, Berne, both of, Switzerland, assignors to Hasler AG, Berne, Switzerland

Filed Nov. 1, 1968, Ser. No. 772,619
Claims priority, application Switzerland, Nov. 7, 1967, 15464/67
Int. Cl. G08c *21/00*
U.S. Cl. 340—196 2 Claims

An angle stepping transmitter for generating electric signals in dependence on the angular position of a shaft comprises two coils connected in the feedback circuit of a high frequency transmitter with an electrically conductive toothed member on the shaft having teeth which travel between the coils, two members of electrical insulation material on which the coils are wound being disposed in openings in the arms of a U-shaped holder.

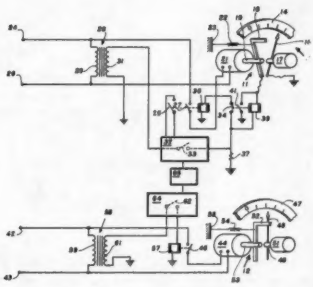


3,594,743

APPARATUS FOR READING THE POSITION OF AN INDICATOR

George D. Rhoades, La Grange Park, Ill., assignor to Liquid Carbonic Corporation, Chicago, Ill.

Filed Oct. 27, 1967, Ser. No. 678,610
Int. Cl. G08c *19/16*
U.S. Cl. 340—203 5 Claims



Apparatus is described for reading the position of an indicator. Scanning means, at the location of the indicator, and readout means are both operable at the same time in response to a read signal. Means are provided for terminating operation of the readout means in a readout position in response to arrival of the scanning means at an indicating position corresponding to the position of the indicator.

3,594,744

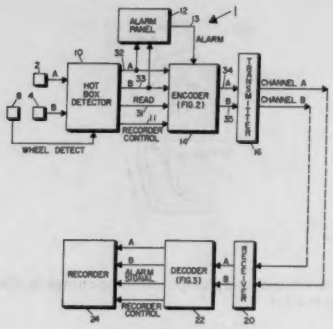
RECORDER CONTROL DEVICE FOR HOTBOX DETECTOR SYSTEM

Paul W. Caulier, Greenwood, Va., assignor to General Electric Company

Filed Apr. 3, 1969, Ser. No. 813,163
Int. Cl. G08c *19/16*
U.S. Cl. 340—206 20 Claims

A hotbox detector system for railway cars is disclosed wherein the heat signals from trackside hotbox detectors are fed to an encoder for transmission to a remote location on a two channel binary carrier system. The encoder also receives information as to when a train is passing the detector and if an alarm condition exists. This information is transmitted over the same two channel carrier system by means of special codes between the two channels. A decoder at the remote location receives the heat signals from the carrier and passes them to a recorder. The decoder continuously monitors the levels of the two channels for the code indicating the presence or absence of a passing train and either turns the

recorder on or off accordingly. Similarly, if the alarm code is detected, the decoder actuates an alarm at the remote location. The integrity of the system is assured since transmission is continuous.

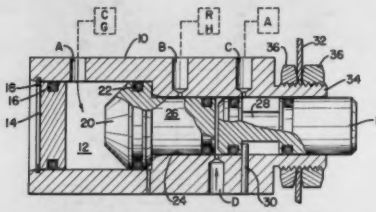


3,594,745

VALVE FOR SIGNALING THREE CONDITIONS

William M. Nickels, Englewood, Colo., assignor to C. A. Norgren Co., Littleton, Colo.

Filed May 8, 1969, Ser. No. 822,931
Int. Cl. G01l *19/12*; G08b *25/00*
U.S. Cl. 340—213.1 **8 Claims**



A piston-type valve operated by air or other gas characterized by an input supply port and an input control port to which equal pressures are applied, a first signal output port communicating with the supply port when the control pressure decays below a predetermined value, and a manually operated spool valve moveable to a position for disestablishing communication between the supply port and first signal port and also establishing communication between the supply port and a second signal output port. The first output port may operate an audible annunciator and visible red light which indicates that the control pressure has decayed and the second output port may operate a signal device, such as an amber light, which indicates that an operator has acknowledged receipt of the previous alarm signal. During normal operation, the control pressure may operate a green light only when its pressure is above a predetermined value. The lights thus operate sequentially, green indicating normal control pressure in the system, red indicating a danger condition and amber indicating acknowledgement of the alarm condition. When the control pressure is restored to normal, the valve parts are automatically moved to their original positions.

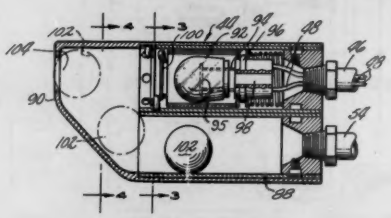
3,594,746

FLAME SCANNER FAULT DETECTION SYSTEM

Vytautas Pileika, West Hartford, and Harry B. Jones, Wethersfield, both of, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 27, 1967, Ser. No. 693,831
Int. Cl. G08b *29/00*, *17/12*
U.S. Cl. 340—214 **4 Claims**

A system for detecting a fault in the output signal of a flame scanner circuit, the system comprising ball means, normally gravity biased to a nonblocking position, periodically pneumatically activated to intercept, and block, the scanning view of a glow discharge tube detector used to indicate the presence of a flame. A logic circuit having an AND gate receives independent signals from the pneumatic activating means for the ball means (indicating ball means actuation) and from the flame scanner circuit (indicating positive firing of the glow discharge tube detector). The tube detector, of course, should not be firing, and thus signaling the existence of a flame, when its scanning view is blocked by the ball means. If both of the above-mentioned signals reach the AND gate at the same instant, the gate will operate to pass a signal to a fault indicator which may operate any suitable alarm means to indicate a fault in the glow discharge tube detector.

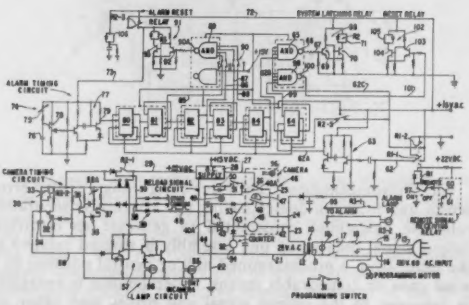


3,594,747

CAMERA AND ALARM SURVEILLANCE SYSTEM

William R. Cronin, Philadelphia, Pa., assignor to Schulmerich Manufacturing Co., Carillon Hill, Sellersville, Pa.

Filed Dec. 6, 1968, Ser. No. 781,938
Int. Cl. G08b *13/00*
U.S. Cl. 340—221 **24 Claims**



A surveillance system for banks and the like wherein a camera is programmed to operate at a normal rate but the rate of operation of the camera may be accelerated by a remote signal in the event of a robbery. An audible alarm is sounded after an adjustable time delay following accelerated operation of the camera. The system may be reset, thereby stopping the sounding of the alarm and returning the camera to a normal rate by a second remote or local signal.

3,594,748

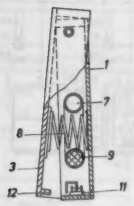
ALARM SIGNALIZER WITH MINIATURE TRANSMITTER

Alfred Grotjahn, 4 Scharnhorststrasse, 3167 Burgdorf, Germany

Filed Oct. 23, 1968, Ser. No. 769,866
Int. Cl. H04b *1/02*
U.S. Cl. 340—224 **9 Claims**

A portable radio transmitter for personal protection

wherein the energizing circuit contains a tilt-responsive switch and a pressure-sensitive switch, both switches normally held in an open circuit condition by the manner in which the transmitter is carried.

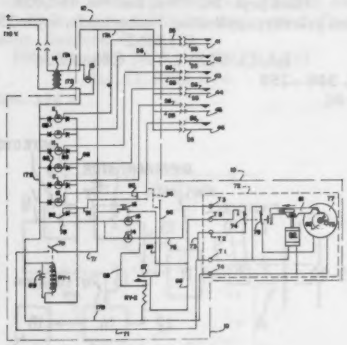


3,594,749

MONITORING SYSTEM FOR REFRIGERATED DISPLAY CASES

Norman P. Bergeron, 9245 S.W. 69th Ave., Portland, Oreg.

Filed Mar. 18, 1968, Ser. No. 713,611
Int. Cl. G08b *17/06*
U.S. Cl. 340—227 **1 Claim**



A warning system is disclosed applicable to indicating higher than desired temperatures in a temperature controlled space such as refrigerated food storage cabinets. A master indicator unit includes means for identifying the particular food storage cabinet having the excessive temperature, such means being operable both during a timed defrost period and a period exceeding the defrost period wherein food spoilage may occur. Provision is made in the present warning system for indicating the failure of continuously operating components of a refrigeration system.

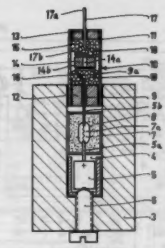
3,594,750

DEVICE FOR MEASURING TEMPERATURE OF MOLTEN MATERIALS AND METHOD OF USE

Erich Mueller, Berlin, Germany, assignor to Continental Elektroindustrie Aktiengesellschaft Akania-Werke, Berlin, Germany

Filed May 13, 1968, Ser. No. 728,645
Claims priority, application Germany, May 12, 1967, S 1 09 860
Int. Cl. G01k *17/00;* **G08b** *17/06*
U.S. Cl. 340—227.1 **9 Claims**

The temperature in a melt is measured by introducing or casting into the melt a device which releases a wireless signal for detection outside the melt at a preset temperature. The device operates by means of a fuse contact which upon melting at a preset temperature activates a signal source.

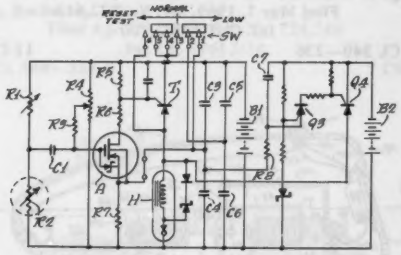


3,594,751

DETECTION OF PRODUCTS OF COMBUSTION

Wilbur L. Ogden, and Clarence Glenn Henderson, both of Aurora, Ill., assignors to BRK Electronics, Inc., Skokie, Ill.

Filed Feb. 29, 1968, Ser. No. 709,415
Int. Cl. G08b *17/00, 29/00*
U.S. Cl. 340—228 **5 Claims**



A self-contained, self-powered, early warning fire detector and alarm of small size and attractive appearance especially adapted for use in residences; the detector including readily accessible sensitivity control and operability test means, and having a standby power source which additionally serves to monitor the primary power source and inform occupants of malfunction of the primary power source.

3,594,752

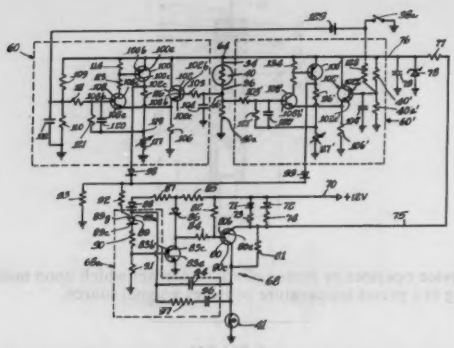
CONDITION SENSING AND ALARM UNIT AND CIRCUIT THEREFOR

Ahdor H. Alton, Lake Zurich, Ill., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed July 7, 1969, Ser. No. 839,520
Int. Cl. F25b *49/00;* **G08b** *21/00*
U.S. Cl. 340—228 **20 Claims**

A readily mountable self-contained temperature sensing and alarm unit having a housing adapted to be mounted on the outside of a refrigerator truck, trailer, railroad car, or other refrigerated container, the housing encasing an alarm lamp, and a temperature sensor preferably attached to the end of an elongated tubular member extending from the rear of the housing to pass through a small opening in the wall of the refrigerated container. The housing may resemble and be of a size of an automobile head light or smaller and include a light dispersing cover plate on the outer front wall of the housing occupying most of the area of the housing so the energization of the alarm lamp is readily visible from many viewing angles. Control circuitry for the alarm lamp preferably is arranged on a printed circuit board having a portion thereof cut out to enable the printed circuit board to fit substantially completely around the alarm lamp within the housing. The control circuitry responds to the temperature

sensor by energizing the alarm lamp which preferably flashes on and off when the temperature sensor, which may be a



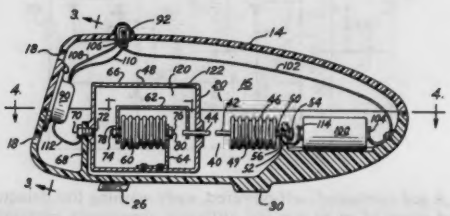
thermistor, senses a temperature above a safe temperature for the product carried within the refrigerated container.

3,594,753

AUTOMATIC TORNADO WARNING DEVICE

George H. Elenbaas, 841 Hiawatha Drive, Elkhart, Ind.

Filed May 7, 1969, Ser. No. 822,613
Int. Cl. G08b *21/00*
U.S. Cl. 340—236 11 Claims



A tornado sensing and warning device having a housing and a switch with two normally spaced contacts, two pressure-responsive means operating in opposite directions to one another for normally maintaining the contacts in spaced relation, and a means for retarding the operation of one of the pressure-responsive means so that the other means may close the switch in response to a sudden drop in barometric pressure. The mechanism is normally enclosed in the housing containing a signal, such as a buzzer, which is operated when the contacts close in response to a sudden drop in barometric pressure.

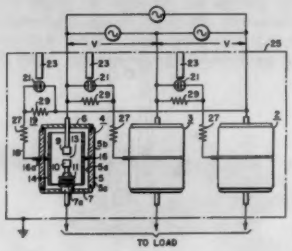
3,594,754

PRESSURE MEASUREMENT ARRANGEMENTS FOR A VACUUM-TYPE CIRCUIT INTERRUPTER

Roy E. Voshall, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1968, Ser. No. 701,007
Int. Cl. G08b *21/00*
U.S. Cl. 340—236 8 Claims

The pressure within a vacuum-type circuit interrupter is measured by imposing a voltage of commercial power frequency between the floating condensing shield and one of the electrodes to determine the magnitude of current flow between these elements in a measuring circuit. A neon bulb may be used in parallel with a resistance in this measuring circuit to continuously indicate the state or condition of vacuum within the interrupter envelope. A glass-fiber rod may conduct the light from the neon bulb, which is at high potential, in its illuminated state, down to the side of a grounded housing. In another arrangement, one side of the



neon bulb may be at ground potential, and consequently an insulating glass-fiber rod for light conduction is unnecessary.

ERRATUM

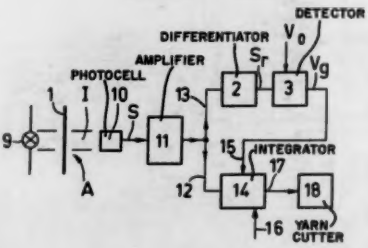
For Class 340—246 see:
Patent No. 3,593,842

3,594,755

YARN SPEED MEASUREMENT ON THE BASIS OF YARN NOISE

Hermanus Stephanus Josephus Pijls, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 24, 1968, Ser. No. 762,058
Claims priority, application Netherlands, Sept. 25, 1967, 6713062
Int. Cl. G08b *23/00*; G08c *19/36*
U.S. Cl. 340—259 16 Claims



A yarn testing device having means for measuring the yarn speed. The device includes a pickup member for deriving a yarn signal from the passing yarn. The yarn signal includes a noise signal component produced by normal irregularities of the yarn, the amplitude and frequency thereof being proportional to yarn speed. A high pass network passes only the noise signal to an amplitude or frequency detector in which it is compared with a reference voltage indicative of a reference yarn speed to derive a signal proportional to yarn speed.

3,594,756

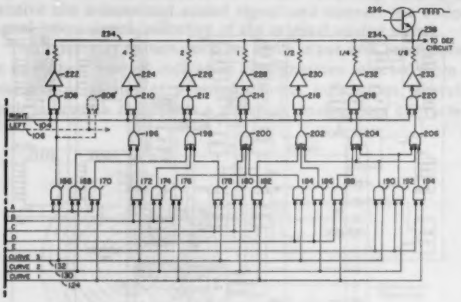
CRT CURVED CHARACTER GENERATOR

Mauritz L. Granberg, Minneapolis; Howard N. Hanson, Minneapolis; Charles A. Kiesling, Minneapolis, and Jerome J. Stoffel, Framington, all of, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 26, 1967, Ser. No. 693,671
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 1 Claim

A character generator for a cathode-ray tube display system including the capability of digitally generating curved

characters. Each diode matrix used for generating a character produces output signals in digital form representing the X-coordinate, the Y-coordinate, the intensity of the particular stroke of the character being drawn, the degree of departure of the stroke from a straight line if it is to be curved and the direction in which it is to be curved.



3,594,757

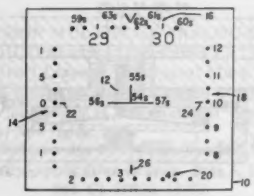
WAVEFORM GENERATOR FOR PROVIDING TAPE DISPLAY OF CONTINUOUSLY CHANGING DATA

Jerold H. Gard, Los Altos, and Charles L. McAfee, San Jose, both of, Calif., assignors to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.

Filed Mar. 20, 1968, Ser. No. 714,512

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **20 Claims**



Electronic generator for providing waveforms which provide a calligraphic display of a selected segment of a movable numerical scale or tape on a visual display device in response to digital inputs representing the information to be presented by the tape on the display.

3,594,758

DRIVE CIRCUITRY FOR DISPLAY TUBES

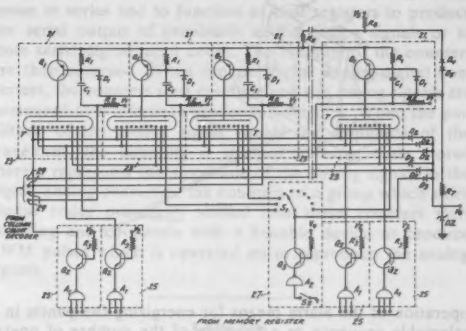
Julius Gluck, Stamford, Conn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 25, 1968, Ser. No. 724,197

Int. Cl. G09f *9/40*

U.S. Cl. 340—324 **8 Claims**

Apparatus for limiting the current, applied to the anodes of a data display system of the type comprising data display tubes having a single anode and a plurality of cathodes, to a constant level when the display tubes are energized as described. The emitter-collector terminals of a current control transistor are connected between an anode voltage source and the anodes of each of the display tubes. The base terminals of the transistors are connected to a voltage limiting zener diode which is biased by the anode voltage source. The zener diode limits the voltage which can be applied to the base of each transistor thereby limiting the current that can flow through each transistor. The base terminals of the transistors are also connected to a control system which controls when a particular anode transistor is to conduct current.



3,594,759

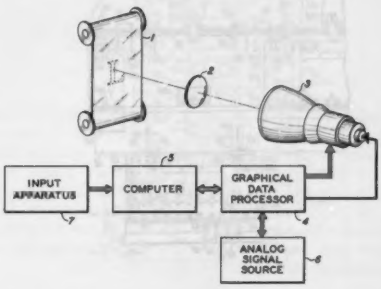
GRAPHICAL DATA PROCESSOR

Edwin J. Smura, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Apr. 29, 1968, Ser. No. 724,746

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **7 Claims**



A digital and analog signal responsive processor generates a visible display of alphanumerics, halftone, or vector information. The processor includes logic circuits for developing dynamic deflection fields in a display cathode-ray tube in response to a sequence of digital codes unique for a particular alphanumeric symbol such that the tube's electron beam is moved or scanned substantially only over the plurality of linear areas of the tube's screen which will collectively display the desired symbol. Additional circuitry is included to generate vectors of any length either at a uniform deflection velocity or during a uniform period of time. In addition, digital circuits are present which may reproduce halftone configurations in a dot-by-dot manner. Beam intensity and focus registers permit the alteration of these qualities of the electron beam as desired.

3,594,760

ADVERTISING DISPLAY DEVICE

Floyd H. Haker, 6546 Linden Lane, Dallas, Tex.

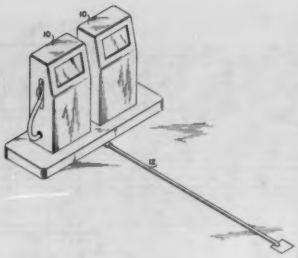
Filed Jan. 30, 1969, Ser. No. 795,308

Int. Cl. G09f *13/04*

U.S. Cl. 340—325 **11 Claims**

An advertising display device comprising a display unit having a plurality of panels, indicia on each of the panels for indicating a certain product or service when the panel is

energized, alarm means responsive to the presence of a prospective customer, and control means responsive to

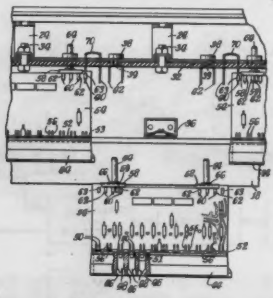


operation of the alarm means for energizing the panels in a selectable sequence as a function of the number of operations of the alarm means.

3,594,761
INFORMATION DISPLAY MODULE

Raymond J. Boesen, Oak Park, and Robert A. Payne, Des Plaines, both of, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Jan. 29, 1969, Ser. No. 795,011
Int. Cl. G09f *7/18*
U.S. Cl. 340—334 **6 Claims**



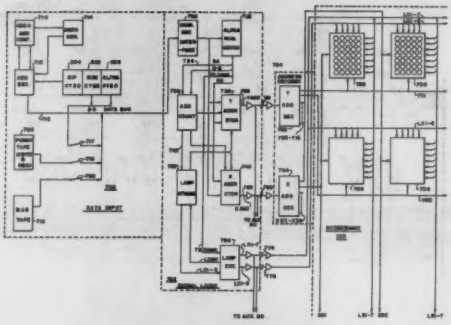
Information display apparatus including a plurality of information display modules removably mounted side-by-side in an elongated housing. Each module comprises a faceplate, display elements arranged within the faceplate, a plurality of parallel printed circuit boards extending normal to the faceplate, tie bar means extending transversely of the printed circuit boards remote from the faceplate, and post members projecting through the tie bar means and secured in the faceplate whereby the printed circuit boards are maintained in assembled relation between the face plate and the tie bar means.

3,594,762
DISPLAY SYSTEM

Joseph Gardberg, Chicago; Robert A. Payne, Des Plaines, and Howard G. Posner, Chicago, all of, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 27, 1967, Ser. No. 626,038
Int. Cl. G09f *9/34*
U.S. Cl. 340—334 **32 Claims**

A control system for a data display system such as a scoreboard, message board or the like wherein display indicators having location addresses, on the board are addressed and actuated through a logic system which first receives and stores address data pertaining to a particular indicator, receives display character data, and responsive to the receipt of the character display data automatically reads out the address data to the board for enabling the desired indicator followed by the display character data to actuate it to display the desired character. Indicator circuits are provided for the control of each indicator comprising semiconductor

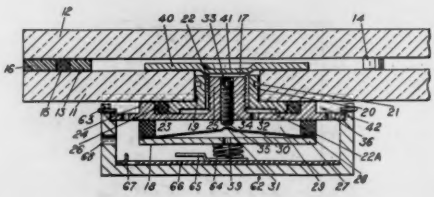


switches which are reset by the addressing of the indicator and actuated to display the desired character responsive to the receipt of the display character data. A memory storage is also provided to cause the display of repeatedly used messages and animated characters.

3,594,763
WINDOWS AND THE COMBINATION THEREOF WITH ALARM MEANS

Cecil H. Peek, P.O. Box 325, Freeport, Bahamas

Filed Aug. 15, 1968, Ser. No. 752,928
Int. Cl. G08b *13/20*
U.S. Cl. 340—240 **4 Claims**



A window comprises two panes of glass spaced apart in parallel relationship by rigid spacers of uniform thickness which are bonded to at least one of the panes, the spacers including a continuous strip placed inwardly of the window periphery and backing sealing means sealing said panes together at the window periphery, the space between the panes being evacuated. A hole in one of the panes used in the evacuation of the space may be plugged by a switch device in circuit with alarm apparatus and adapted to react to operate the alarm apparatus on equalization of the pressures within and external to the window.

3,594,764
ANALOG CONVERTER AND TRANSLATOR NETWORK THEREFOR

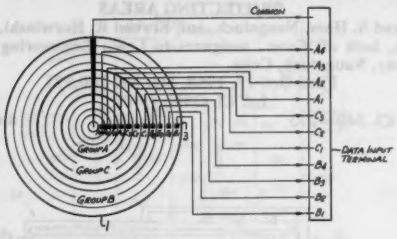
Matthew John Walsh, Pittsburgh, Pa., assignor to NUS Corporation, Rockville, Md.

Filed June 27, 1968, Ser. No. 740,583
Int. Cl. G08c *9/08*
U.S. Cl. 340—347 P **9 Claims**

A telemetry system for transmitting and monitoring analog data from a remote station to a receiving station with transducer means in the form of an encoder to convert the analog signal into digital intelligence in the form of a coded signal to be transmitted over the telemetry system, preferrably over

the standard switched telephone network through, for example, the application of the data phone system of the American Telephone and Telegraph Company, the intelligence being transmitted over the data phone system through the use of coded tones produced by multifrequency oscillators. A decoding network is provided at the receiving station to receive the transmitted coded signal and convert the coded signal into a signal indicative of the original analog signal.

The telemetry system receives at its input and reproduces at its output, contact indication combinations selected from a plurality of groups of possible contact indications wherein each indication represents a different analog data character



or value and no more than one contact indication is normally permitted within each group for any one possible combination. Each contact indication represents a different analog value and each group of contact indications represents a different arithmetic progression of the analog values wherein the first term of each successive progression equals the last term of the preceding progression plus the common difference of the preceding progression and wherein the common difference of each successive progression is equal to its first term. The contact indications are additive for each given possible combination to provide a digital code representative of an arithmetic progression of terms corresponding to the range of analog data values to be transmitted.

3,594,765

TIME DIVISION MULTIPLEX ANALOG-DIGITAL OR DIGITAL-ANALOG CONVERTER

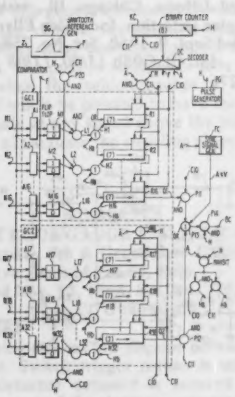
Claude Paul Henri Lerouge, Maurepas; Marc Andre Regnier, Aulnay-Sous-Bois, and Didier Charles Strube, Garches, all of, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 26, 1968, Ser. No. 786,918

Claims priority, application France, Jan. 3, 1968, 134640

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 AD **10 Claims**



A plurality of binary counters are provided, each of which are assigned to a different channel signal, and arranged in two groups. A timing signal source and logic circuitry associated with each counter cooperate to cause the counters of one group to convert the analog or digital signal of that group and simultaneously connect the counters of the other group in series and to function as shift registers to produce the serial output of previously coded analog signals or to store serial digital input codes. The function of the counters are then reversed. When functioning as analog-digital converters, the counters start counting and the analog signals are compared to a reference sawtooth waveform. When the amplitude of the analog signal equals the amplitude of the waveform, the counting is stopped and the code stored therein represents the amplitude of the analog signal. In the digital-analog converter, the counters of a group which store digital codes previously shifted into these counters start counting and cooperate with a bistable device to produce PWM pulses which is operated on to reproduce the analog signals.

3,594,766

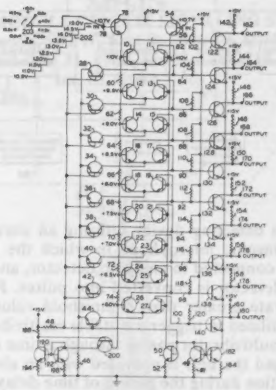
ANALOG TO DIGITAL CONVERTER INCLUDING COMPARATOR CIRCUITS WITH INTERNAL LOGIC

Barrie Gilbert, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 24, 1969, Ser. No. 793,651

Int. Cl. H03k *13/175*

U.S. Cl. 340—347 AD **12 Claims**



An analog to digital converter is described having a differential analog input and a plurality of parallel digital outputs which includes a plurality of comparator circuits, each including a pair of emitter coupled transistors having a pair of inputs and a pair of outputs. The inputs formed by the bases of one transistor in each of the comparator circuits are connected in sequence through a voltage divider to one input terminal of the converter and the outputs at the collectors of such one transistors are connected by internal logic in common with the outputs at the collectors of the other transistors in the next preceding comparator circuit so that only when both transistors are nonconducting is an output pulse transmitted to an output terminal of the converter. The converter may have 10 parallel outputs and be used to provide a decimal readout for a 10-position rotary switch by applying a stairstep voltage whose steps correspond to the positions of such switch, as the analog input signal of the converter.

3,594,767

ELECTRIC LINE FAULT INDICATOR

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

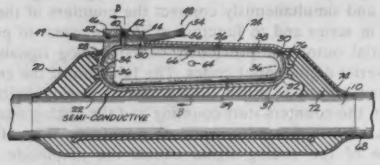
Filed Aug. 28, 1968, Ser. No. 756,066

Int. Cl. G08b *21/00*

U.S. Cl. 340—253 **10 Claims**

Disclosed herein is a high voltage underground cable fault indicator having a rotor mounted for movement within a

sealed housing with a voltage sensitive element to move the rotor in one direction and a current sensitive element to



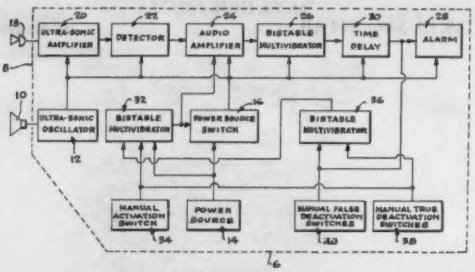
move the rotor in the other direction. Light conductive members may be connected to the housing to provide a visual indication of the position of the rotor in the housing.

3,594,768

MOTION DETECTING APPARATUS AND INTRUDER ALARM

George Allen Harris, 7764 West Fourteenth Court, Hialeah, Fla., and Alpha M. Wiggins, Apartment 519, El Monte Apartment, Hato Ray, P.R.

Filed Jan. 16, 1967, Ser. No. 609,514
Int. Cl. G08b *13/16*
U.S. Cl. 340—258 A 8 Claims



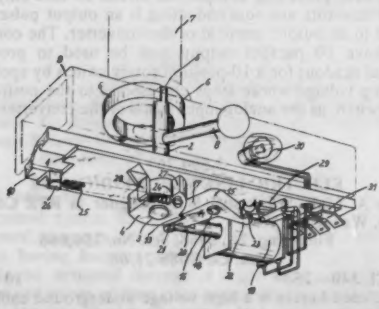
A motion detecting device utilizing an ultrasonic radiator and an ultrasonic microphone in which the microphone is electrically connected to an audio detector, and the output of the audio detector is converted into pulses. Pulses having a repetition rate greater than a threshold value are accumulated and utilized to trigger a bistable multivibrator. The output of the multivibrator passes through a time delay device to an alarm, and the unit is provided with an electronic switch for deactuation during the period of time delay.

3,594,769

PULSE ACTUATED SOLENOID FOR BROKEN THREAD DETECTOR

Willy Heimes, Krefeld, Germany, assignor to Palitex Project Company GmbH, Krefeld, Germany

Filed Sept. 26, 1967, Ser. No. 670,541
Claims priority, application Germany, Dec. 22, 1966, P 41070
Int. Cl. G08b *21/00*
U.S. Cl. 340—267 2 Claims



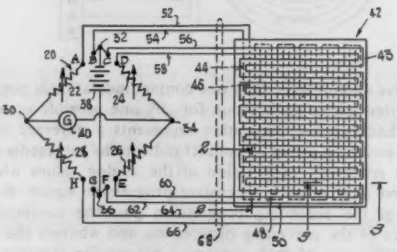
Method and apparatus wherein a solenoid actuated armature moves a latch out of latching engagement with a member which is biased to move when so released; in which the solenoid is energized by a series of current pulses rather than by a continuous supply of current and movement of the latch to release position interrupts the circuit to said solenoid while a counter counts the pulses to the solenoid and interrupts the circuit thereto when a certain number of pulses have been supplied to the solenoid, and while a signal lamp is illuminated whenever the latch moves to release position or whenever the counter interrupts the circuit to said solenoid.

3,594,770

PRINTED-CIRCUIT TYPE SECURITY APPARATUS FOR PROTECTING AREAS

Conrad S. Ham, Naugatuck, and Elwood R. Horwinski, Cheshire, both of, Conn., assignors to Lewis Engineering Company, Naugatuck, Conn.

Filed Oct. 28, 1968, Ser. No. 780,931
Int. Cl. G08b *13/00*
U.S. Cl. 340—273 4 Claims



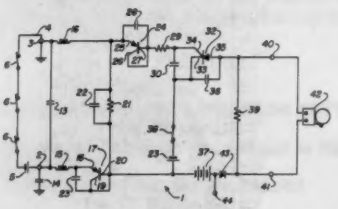
A guarding apparatus responsive to violation of the security of an area or space, comprising a printed or similar gridlike circuit configuration of conductors, preferably of resistance characteristic, connected to form one or several continuous trigger circuits. The configuration may be in the nature of printed circuit panels arranged to enclose, preferably completely, the desired area of security, as by constituting part of the walls, floor, junction or connector boxes and the like. The circuitry is connected, as by a cable, to an energized electrical detector which may comprise an instrument movement and a bridge, whereby any shorting or breaking of one or more of the printed or similar conductors will result in a response by the instrument movement.

3,594,771

SOLID-STATE BURGLAR ALARM DETECTOR

Clifford Howard Uthene, Chicago, Ill., assignor to Chicago Fire and Burglar Detection, Inc., Glen Ellyn, Ill.

Filed Sept. 9, 1968, Ser. No. 758,410
Int. Cl. G08b *13/00*, *13/08*
U.S. Cl. 340—276 3 Claims



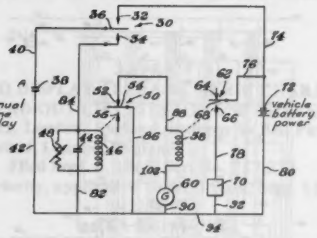
A burglar alarm detector including a silicon controlled rectifier which is triggered to activate alarm means by means of coupling means included in the input circuit thereof, which coupling means is, in turn, responsive to a predetermined condition of a protective circuit.

3,594,772

SLEEP SENSING DEVICE

Donald D. Setser, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 12, 1968, Ser. No. 752,018
Int. Cl. G08b 21/00
U.S. Cl. 340—279 6 Claims



The invention relates to apparatus for sensing drowsiness of an operator of a motor vehicle which includes a multiple contact sensing switch coupled to or actuated by movement of the steering mechanism of the motor vehicle, means for maintaining a predetermined charge on a condenser in a relay time constant circuit under one condition of motor vehicle operation, means for discharging said condenser at a predetermined rate if the mode of steering the vehicle is changed, and alarm means actuated by said relay when said condenser's charge level reaches a predetermined level and the output of a generator mechanically coupled to the vehicle drive means and electrically coupled to the alarm circuit exceeds a predetermined voltage.

The output of this generator increases with an increase in road speed of the vehicle. An alarm relay placed in series with the time delay relay contacts controls the operation of the alarm signal. The pull in voltage for this relay is selected so that only when the vehicle reaches a certain selected minimum speed will it be possible to have the alarm relay actuate. It will actuate at any speed above the minimum speed if the driver does not actuate the steering wheel within the time delay interval.

The output of thik generator increaseb with an qncrease in road spe5d of the vehicle. An alarm relay placed in serivs with the time delay relay contacts controls the operation of the alarm signal. The pu2l in volt1ge for te9s relay is selected so that only when the vehiclereaches a certain s5lected minimum speed will it be possibl5 to have the alarm relay actute. It oill actuale at any speed above the minimum speed if the driver does n2t actuate the steer9ng wheel oithin the time delaq interval.

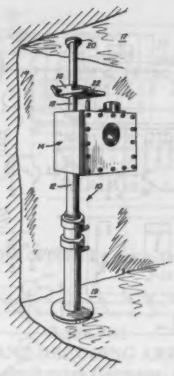
3,594,773

MINE ROOF GAUGE AND INDICATOR

Ellsworth V. Conkle, 5th & Grand, and Charles E. Bear, 326 North Fork Ave., both of Paonia, Colo.

Filed Nov. 12, 1968, Ser. No. 775,046
Int. Cl. G08b 21/00
U.S. Cl. 340—282 3 Claims

Two telescoping sleeves are dispose between the roof and floor of a mine. Switch trigger means is secured to a first sleeve and a detector actuator is secured to the second sleeve. The trigger and the detector actuator are positioned in registry with one another and separated by a predetermined distance. Displacement of a mine roof by a distance exceeding the predetermined space between the trigger and actuator causes operation of an alarm circuit thus signaling the occurrence of an emergency situation. A second embodiment utilizes the telescoping sleeves and a displacement gauge mounted thereto for monitoring roof displacement.

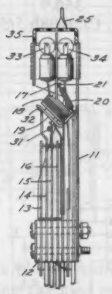


3,594,774

PLURAL MODULE CIRCUIT SIGNALING SYSTEM

Herman L. Dawson, 601 W. Fort St., Detroit, Mich.

Filed Dec. 31, 1968, Ser. No. 788,215
Int. Cl. G08b 5/00
U.S. Cl. 340—286 23 Claims



A signaling system including a plurality of switching modules each of which includes a manually operated member adapted to be selectively actuated to one of four positions and a remotely operated switch which, upon actuation, changes the position of the manually operated member. Each switching module further includes indicia means in the form of lightbulbs.

3,594,775

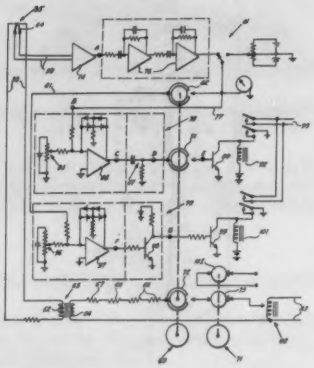
SYSTEM FOR DETECTING FROST, SNOW AND ICE ON A ROAD SURFACE

Norbert K. Fox, 903 Grand Ave., Ames, Iowa

Filed July 9, 1969, Ser. No. 840,408
Int. Cl. G08b 21/00
U.S. Cl. 340—234 5 Claims

A transducer has a member with a sensing surface located in the road level which member, when dry and a controlled heat is applied thereto has a basically linear time-temperature curve. The forming of ice on the sensing surface modifies the linear curve by effecting a holdup in the temperature rise due to the heat of fusion of the ice. The resultant heating curve characteristics of the sensing surface are converted to

voltage by a thermocouple means, and the variations in the voltage effected by the holdbacks in the heating curve are double differentiated to produce the second derivative of the



initial time-temperature curve. Voltage excursions that exceed predetermined positive and negative levels within specified time intervals are utilized to indicate an icy road condition.

3,594,776

VISUAL POSITION INDICATING CIRCUIT FOR SWITCHING EQUIPMENT

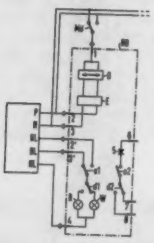
Otto Wildgruber, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Nov. 4, 1969, Ser. No. 873,948

Claims priority, application Germany, Nov. 22, 1968, P 18 10 350.9

Int. Cl. G08b *5/36*

U.S. Cl. 340—332 **3 Claims**



In one condition of switching equipment a pair of relays closes a circuit for intermittent energization of a colored pilot lamp. In another condition of switching equipment, the pair of relays closes a circuit for continuous energization of another pilot lamp of a different color.

3,594,777

QUICK-CHANGE ELECTRIC SIGN

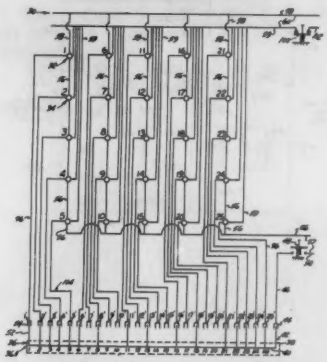
Johnny E. Blair, Box 3, Van, W. Va.

Filed Nov. 19, 1968, Ser. No. 776,941

Int. Cl. G09b *13/00*

U.S. Cl. 340—334 **10 Claims**

The message on this electric sign can be quickly changed from one message to another letter-by-letter by removing a conductor bridge bar from the sign lamp circuit block illuminating the lamp forming the first letter and substituting another conductor bridge bar for illuminating the necessary lamps for the new first letter and so on similarly for each letter of each word. Each letter of the alphabet has a different bridge bar according to the lamps required to outline that letter in its lamp circuit block, and a word in the sign is made up of a combination of lamp circuit blocks employing a different bridge bar for each different letter of the word. Each lamp employed for outlining the letters is a special lamp of the type disclosed and claimed in my copending application Ser. No. 730,407 filed May 20, 1968 for Dual Voltage Automatic-Switching Electric Lamp, now U.S. Pat. No. 3,524,100. The filament of this special lamp is initially energized by a starting voltage and automatically shifted over to an operating voltage by a thermostatic switch contained within the lamp bulb and responsive to the heat emitted by the filament. The instant the operating circuit is interrupted, the cooling of the filament causes the thermostatic switch



within each lamp to shift back to its starting voltage contact ready to be reenergized by the next closing of the circuit thereof, as by the substitution of another bridge bar. The use of this lamp in the present sign circuit eliminates many relays and controllers required in prior sign circuits. The sign itself contains as many blocks of lamps as are necessary to form the desired message with the maximum number of letters, e.g. a 50-letter message would require 50 blocks of lamps with 50 bridge bars or other selective bulb-group-energizing switches or controllers, spacing between words on the same line being accomplished by energized blocks spaced by unenergized blocks.

3,594,778

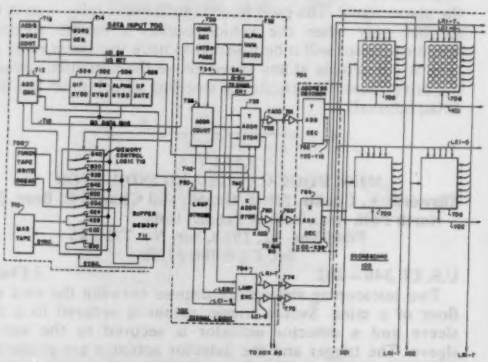
DISPLAY SYSTEM

Vernon R. Herald, Chicago; Paul M. Kolesar, Chicago, and Robert A. Payne, Des Plaines, all of, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 28, 1967, Ser. No. 626,459

Int. Cl. G09f *9/34*

U.S. Cl. 340—337 **20 Claims**



Control System for a data display system such as a scoreboard, message board or the like wherein display in-

dicators having location addresses, on the board, are addressed and actuated through a logic system which first receives and stores address data pertaining to a particular indicator, receives display character data, and automatically reads out the address data to the board for enabling the desired indicator followed by the display character data to actuate it to display the desired character. A buffer memory is provided for controlling the input to the logic system from a variety of input devices including console keyboard, punch tape typewriter and reader as well as magnetic memory storage devices. Circuits are provided in conjunction with the buffer for updating particular message data existing in the buffer as required by changes in the game or other information.

3,594,779

TUBES TO DISPLAY ALPHA-NUMERIC CHARACTERS AND READ-OUT CIRCUITS FOR USE THEREWITH

Norbert Kitz, London, England, assignor to Bell Punch Company Limited, London, England

Filed Sept. 4, 1968, Ser. No. 757,372
Claims priority, application Great Britain, Sept. 15, 1967, 42234/67
Int. Cl. H01j *17/00*
U.S. Cl. 340—343 **5 Claims**

A numerical display system has a dual-number cathode glow tube with separate anodes and interconnected cathodes to permit selective display of alternative sets of numbers in the tube. A tube having two display windows comprises two vertically positioned numerical displays having half cylindrical anodes separated by an insulating disc and having commonly connected cathodes of the same number, all mounted on a single connector arrangement. The cathodes and anodes are driven separately from counter registers of an electronic calculating machine for selective cathode glow lighting in response to pulse countout of register information.

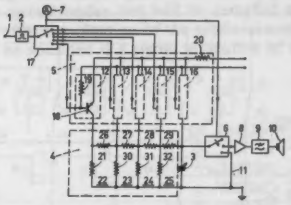
3,594,780

DIGITAL TO ANALOG CONVERTER HAVING CAPACITOR CHARGED BY INPUT CODE PULSES

Johannes Anton Greefkes, and Henricus Petrus Johannes Boudewijns, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 3, 1968, Ser. No. 757,018
Claims priority, application Netherlands, Sept. 2, 1967, 6712081
Int. Cl. H03k *13/10*
U.S. Cl. 340—347 DA **11 Claims**

A digital to analog converter for sequential weighted pulse groups features a capacitor coupled to a resistor ladder network. The pulses are applied to a distributor and then to a pulse circuit which charges the capacitor from different



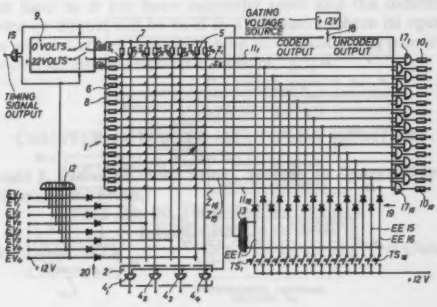
points on the network depending upon the weighted value of the pulse.

3,594,781

ENCODING AND DECODING ARRANGEMENT

Heinz Gerjets, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Dec. 23, 1968, Ser. No. 786,138
Claims priority, application Germany, Dec. 28, 1967, P 15 37 289.1
Int. Cl. H03k *13/243*
U.S. Cl. 340—347 DD **14 Claims**



A single diode matrix is used both for decoding encoded information and encoding uncoded information. The column lines of the matrix are connected to receive coded signals, and are further connected on the same side to furnish coded output signals. The rows of the matrix are connected on one side to receive uncoded input signals and, on the same side to furnish uncoded output signals. The other end of the column line is connected to a zero voltage source which is set in response to any incoming uncoded signal. The other end of the row conductors is connected to a 22 volt operating voltage which is set in response to receipt of any coded input signal. The signal for furnishing the 0 and 22 volt operating levels are derived from a second and first OR gate respectively. The output of these OR gates are also connected to a third OR gate, whose output thus furnishes timing signals.

3,594,782

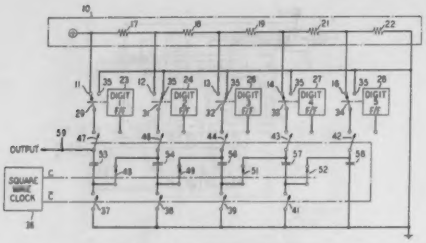
DIGITAL-TO-ANALOG CONVERSION CIRCUITS

Robert L. Carbrey, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 20, 1969, Ser. No. 808,769
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA **10 Claims**

Digital-to-analog conversion circuits are described in which a plurality of capacitors are charged by digitally

weighted voltages. The capacitors are then placed in series to provide an analog output voltage. A system is also shown in



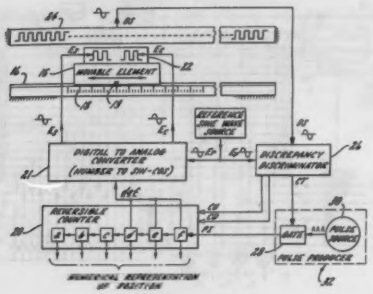
which a plurality of these digital-to-analog conversion circuits are operated from a common voltage source.

3,594,783

APPARATUS FOR NUMERICAL SIGNALING OF POSITIONS, INCLUDING DIGITAL-TO-ANALOG CONVERTER

Thomas B. Bullock, Fond du Lac, Wis., assignor to Giddings & Lewis Inc., Fond du Lac, Wis.

Division of Ser. No. 632,591, Apr. 21, 1967, Pat. No. 3,553,647.
Filed Aug. 7, 1969, Ser. No. 862,123
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 14 Claims



Apparatus for producing digital signals which numerically represent at all times the position of a movable element as it moves to different positions along its path of travel. The digital signals in the form of bilevel voltages are produced in a multidecade reversible counter to represent the position numerically in binary coded decimal notation. These signals are supplied to a digital-to-analog converter whose analog output, corresponding to the represented position, is supplied to a resolver type transducer mechanically coupled to the element. The transducer produces a discrepancy signal representing the sense and extent of any difference between the numerically represented position and the actual position of the element. So long as the discrepancy signal exists, pulse producing means are enabled to supply pulses to the counter so as to correctively change the number signaled by the counter until the difference and the discrepancy signal are reduced substantially to zero. The closed loop correction is very rapid, so for practical purposes the number digitally signaled by the counter always represents the actual position of the movable element.

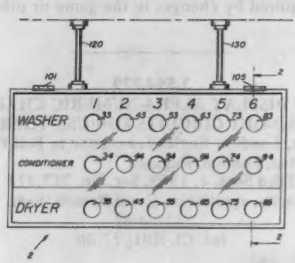
The digital-to-analog converter here disclosed is the type which produces sine and cosine function signals for excitation of a resolver type transducer. This converter is characterized by cross-coupling of the outputs and inputs of two algebraic combining devices such as operational amplifiers, by static switching means responsive to input signals digitally representing a changeable number, and by simple resistors selectively rendered effective to produce AC signals proportional to sine and cosine functions of the sums of angles corresponding to higher and lower order portions of the changeable number.

3,594,784

COMMERCIAL LAUNDROMAT SIGNALING SYSTEM

John A. Femminella, 294 Newport Road, Uniondale, N.Y.

Filed Apr. 14, 1969, Ser. No. 815,739
Int. Cl. G08b *5/36*
U.S. Cl. 340—372 9 Claims



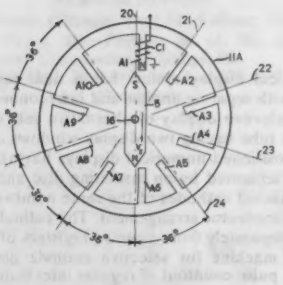
An improvement in a commercial laundromat equipped with a plurality of washing machines and/or dryers, said improvement comprising a remotely positioned indicator panel, said indicator panel equipped with a plurality of indicator means at least one of such means is responsive to the stage of use of a corresponding washing machine or dryer, each of said washing machines and/or dryers in signaling combination with at least one of said indicator means.

3,594,785

ELECTROMAGNETIC INDICATOR HAVING ASYMMETRICALLY POLED STATOR

Louis L. Orenbuch, South Weymouth, Mass., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Oct. 1, 1969, Ser. No. 862,873
Int. Cl. G08b *5/24*
U.S. Cl. 340—378 R 3 Claims



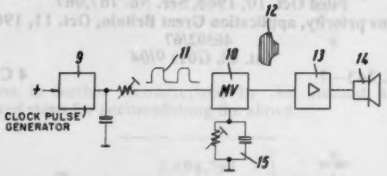
An indicator is disclosed having a rotor which is able to turn promptly to 180° opposed positions to permit the successive display of diametrically opposed symbols carried on a drum. The position of the rotor drum is governed by a stator having poles projecting inwardly from an annular core. Windings on the poles are arranged to permit the stator to establish any one of a number of differently oriented magnetic fields. The rotor has a permanent magnet which rotates about an axis at the geometric center of the annular core to align itself with the stator's magnetic field. The poles of the stator are arranged on the annular core in pairs which are not diametrically opposed but are aligned to cause the vector representing the stator's field to be parallel to and offset from the aligned position taken by the permanent magnet.

3,594,786

ELECTRONIC ARRANGEMENT FOR SIMULATING ANIMAL SOUNDS

Hans G. Brunner-Schwer; Hansrichard Schulz, and Joachim Bulow, all of Villingen/Black Forest, Germany, assignors to Saba Schwarzwalder Apparate-Bau-Anstalt August Schwer Sohne GmbH, Villingen am Black Forest, Germany

Filed June 4, 1968, Ser. No. 734,845
Claims priority, application Germany, June 6, 1967, S 110195
Int. Cl. G08b 3/00
U.S. Cl. 340—384 4 Claims



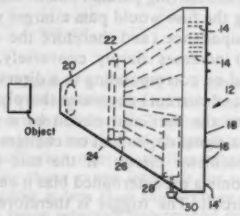
An electronic arrangement for simulating sounds emitted by animals. A clock pulse generator transmits pulses which are partially differentiated and/or integrated. The resulting pulse signals are applied to a series of astable multivibrator circuits which synthesize audiofrequency signals representing the various types of animal cries. Multivibrator circuits may be combined with each other in a particular arrangement, and these combinations may be operated in conjunction with variable integrating and differentiating circuits to produce the desired results. Loud speakers powered by amplifiers emit in audible form the signals provided and processed by the multivibrators.

3,594,787

SCENE SCANNER AND TACTILE DISPLAY DEVICE FOR THE BLIND

Millard J. Ickes, 2020 Davies Way, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 718,583, Apr. 3, 1968. This application July 16, 1969, Ser. No. 842,265
Int. Cl. G08b 1/00
U.S. Cl. 340—407 7 Claims



A scene scanner and display device is provided which utilizes a plurality of electrically energizable pins to provide a tactile stimulus to a blind person, representing the shape or outline of an object in the field of view of the device. A lens system focuses a limited scene area on a matrix of optical sensors which are individually connected to corresponding matrix of display elements, such as electrically energizable pins. A control permits an adjustment of the sensitivity of the sensors. Objects in a "viewed" scene are represented by protruding pins in the general configuration or shape of the object.

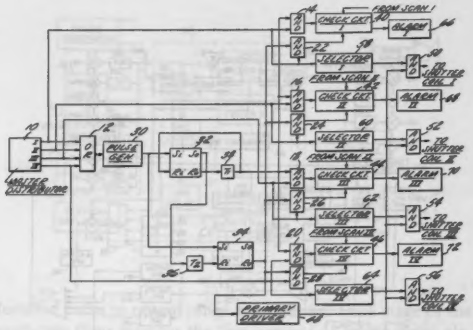
3,594,788

SENSOR TESTING DEVICE

Martin L. Seelig, Springfield, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 27, 1967, Ser. No. 693,972
Int. Cl. G08b 29/00
U.S. Cl. 340—410 11 Claims

Apparatus for sampling the output of a selected condition responsive device or circuit wherein an artificial condition is created and presented to the circuit or device under test. In the disclosed embodiment, the artificial condition is provided by closing a shutter positioned between a sensing element and the environment or condition to which it is normally responsive. Logic circuitry is provided whereby the output of the device or circuit under test will be sampled a predetermined period after the creation of the artificial condition and an alarm will be sounded if a signal indicative of a malfunction is received during the sampling period. After a predetermined additional time lapse, the artificial condition is removed and normal operation is restored with the exceptions that the alarm, if energized, will remain operative until such time as it has been manually reset and the defective device or circuit will be held in a condition where its operation will not effect the functioning of or indications provided by other condition responsive devices.

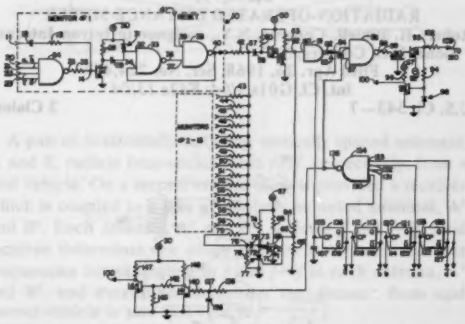


3,594,789

COUNTER ACTUATED MULTIPLEX MONITOR CIRCUIT

Donald J. Rotier, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 30, 1968, Ser. No. 701,614
Int. Cl. G08b 26/00
U.S. Cl. 340—413 6 Claims



A multiplex monitor circuit providing output indications of out-of-tolerance signals from one or more of a plurality of test points. Test point signals are fed to a plurality of comparators whose outputs drive bistable circuits. The bistable circuits are sequentially enabled by a counter fed by their output pulses. A timer advances the counter in the absence of a bistable circuit output pulse and provides test point failure indication. Means for identifying the failed channel are also disclosed.

3,594,790

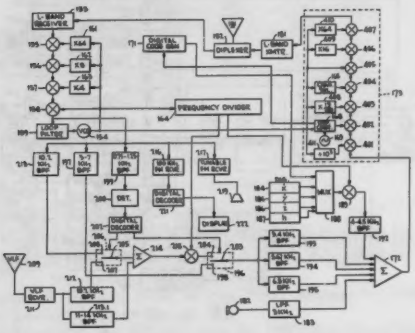
POSITION LOCATION SYSTEM AND METHOD

Charles R. Laughlin, Silver Spring, Md., and Roger C. Hollenbaugh, Chambersburg, Pa., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Division of Ser. No. 701,744, Jan. 30, 1968, Pat. No. 3,495,260. Filed Nov. 28, 1969, Ser. No. 880,885

Int. Cl. G01s 9/56

U.S. Cl. 343—6.8 R 13 Claims



Disclosed are a system and method for position locating, deriving centralized air traffic control data and communicating via voice and digital signals between a multiplicity of remote aircraft including supersonic transports and a central station, as well as a peripheral ground station (or stations), through a synchronous satellite relay station. Side tone ranging patterns, as well as the digital and voice signals, are modulated on a carrier transmitted from the central station and received on all of the supersonic transports. Each aircraft communicates with the ground stations via a different frequency multiplexed spectrum. Supersonic transport position is derived from a computer at the central station and supplied to a local air traffic controller. Position is determined in response to variable phase information imposed on the side tones at the aircrafts, with a plurality of different side tone techniques being employed, and relayed back to the transports. Common to all of the side tone techniques is Doppler compensation for the supersonic transport velocity.

3,594,791

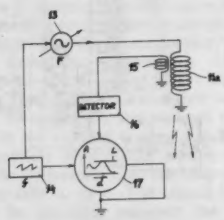
RADIATION-OPERATED DISTANCE METER

Robert H. Pintell, Congers, N.Y., assignor to Intron International Inc., Congers, N.Y.

Filed Apr. 26, 1968, Ser. No. 724,467

Int. Cl. G01s 9/04; F42c 13/04

U.S. Cl. 343—7 3 Claims



A vehicle carrying a transmitter of high frequency waves is equipped with means for measuring the current flow in its transmit-receive antenna; in the vicinity of a reflecting object, at distances from the transmitter related in a predetermined manner to the operating wavelength, the antenna current or its derivative reaches a series of peaks whose amplitude increases with diminishing distance. If the operating frequency is varied, distance (e.g. from ground) may be determined as a function of the wavelength at the tallest peak observed with decreasing frequency; a constant operating frequency may be used for actuating a load (e.g. a detonator) upon the vehicle approaching within a predetermined distance of an object as determined by current or voltage measurements.

3,594,792

PROXIMITY SENSING DEVICES

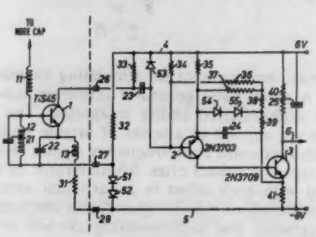
Edmund John Gowler, Sunbury-on-Thames, and Patrick Anthony McDonald, Staines, both of, England, assignors to Electric & Musical Industries Limited, Hayes, England

Filed Oct. 10, 1968, Ser. No. 767,067

Claims priority, application Great Britain, Oct. 11, 1967, 46502/67

Int. Cl. G01s 9/04

U.S. Cl. 343—7 4 Claims



An improved proximity fuse is described in which an oscillator circuit supplies electrical oscillations to a radiating and receiving antenna. In the presence of a target, the impedance of the antenna, and therefore the current drawn by the oscillator circuit changes due to interaction between radiated and reflected energy. At target-to-antenna distances of less than half wavelength of the electrical oscillation, the impedance variation is substantially greater than that at greater distances and is dependent upon the angle of approach of antenna and target. If the two are moving parallel one to the other, so that a missile carrying the fuse would pass a target without hitting it the antenna impedance (and therefore the current drawn by the oscillator) increases sharply; conversely, if the two are approaching head-on corresponding to a direct hit condition, the impedance (and current) decreases sharply. A trigger circuit is coupled to the oscillator circuit by a sensing means which produces a signal dependent on changes in the current drawn by the oscillator circuit. If the said signal is large enough to overcome a predetermined bias it causes triggering of the trigger circuit. The trigger is therefore not triggered until the distance from the target is less than a half of the wavelength of the radiated oscillation and then only on a near miss condition. Another trigger may be provided, set for the direct hit condition.

3,594,793

METHOD AND APPARATUS FOR DETERMINING THE RATE OF CHANGE OF A TIME INTERVAL

John L. Aker, Olathe, Kans., assignor to King Radio Corporation, Inc., Olathe, Kans.

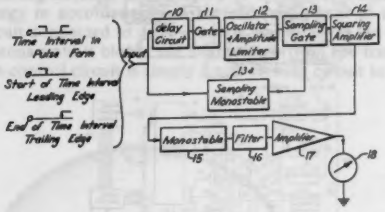
Continuation of application Ser. No. 636,297, May 5, 1967, now abandoned. This application July 25, 1968, Ser. No. 751,677

Int. Cl. G01s 9/44

U.S. Cl. 343—7.3 19 Claims

A ground or relative speed indicator circuit that detects the rate of change of the duration of a pulse or voltage block whose duration is representative of the distance from an airborne receiver to a ground transmitter. The circuit develops a low frequency signal from the detected rate of change. The frequency of this signal is a direct function of the speed of

the airborne receiver relative to the ground transmitter and is therefore measured and displayed to indicate same. The invention is further characterized by the method and associated steps for accomplishing the above.

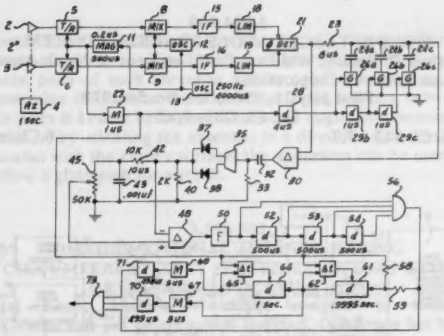


3,594,794

RADAR TARGET DETECTION DEVICE

Howard S. Halpern, Stamford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 25, 1969, Ser. No. 836,495
Int. Cl. G01s 9/06
U.S. Cl. 343—11 **10 Claims**



Clutter discrimination is effected in a phase interferometer radar system by varying the transmitted frequency, detecting resultant fluctuations from the mean elevation angle of return within a large number of range intervals, extracting the average fluctuation over a small number of range intervals, determining those range intervals for which the instantaneous fluctuation is less than the average fluctuation, and correlating the range intervals determined over a plurality of transmitted pulses to select any range interval consistantly providing relatively smaller fluctuations in apparent elevation angle and hence containing some radar target. The selected range interval may further be correlated over a plurality of azimuthal scans to provide additional discrimination.

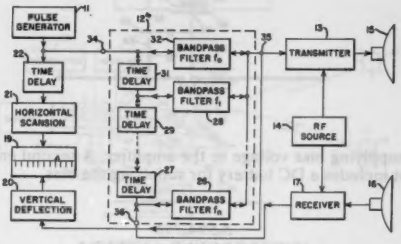
3,594,795

RADAR SYSTEM

Robert C. Thor, Liverpool, and Earl R. Wingrove, Jr., Clay, both of, N.Y., assignors to General Electric Company

Division of Ser. No. 706,048, Dec. 30, 1967.
Filed Dec. 23, 1968, Ser. No. 834,566
Int. Cl. G01s 9/233
U.S. Cl. 343—17.2 PC **3 Claims**

The present invention deals with a multiple stage pulse modifying filter having a time delay characteristic which is a function of frequency over a prescribed band of frequencies and a radar system which incorporates this filter. The filter has a double input and a single output, the respective paths between the respective inputs and said output having a reciprocal transfer characteristic over a prescribed band of frequencies. During transmission the filter is used to expand a short duration pulse applied to one input terminal and the expanded pulse is coupled from the output terminal of the filter to a transmitter for transmission. The echo of the transmitted pulse is then applied to the second input terminal of the filter for compression of the received echo pulse. The shortened echo pulse is then compared with the initial short duration pulse to obtain range information. Each stage of the band-pass filter save for the first consists of a time delay element connected in series with a band-pass filter, the first stage having a band-pass filter, with each subsequent stage being coupled between the input and output terminals of the band-pass filter of the preceding stage.

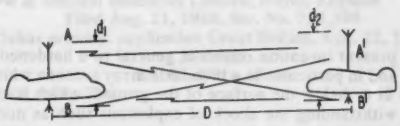


3,594,796

DISTANCE MEASURING

Charles W. Earp, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 12, 1969, Ser. No. 823,904
Claims priority, application Great Britain, July 18, 1968, 34,323/68
Int. Cl. G01s 5/14, 11/00
U.S. Cl. 343—112 R **7 Claims**



A pair of horizontally radiating vertically spaced antennas, A and B, radiate frequencies f and $f+\delta f$, respectively, from a first vehicle. On a second vehicle there is provided a receiver which is coupled to a pair of similarly mounted antennas, A^1 and B^1. Each antenna, A^1 and B^1, receives f and $f+\delta f$. Said receiver determines the phase difference between the best frequencies corresponding to f and $f+\delta f$ at each antenna, A^1 and B^1, and determines therefrom the distance from said second vehicle to said first vehicle.

3,594,797

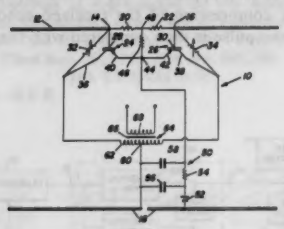
COMBINATION PUSH-PULL AMPLIFIER AND ANTENNA

Eugene F. Pereda, 460 Electric Ave., Seal Beach, Calif.

Filed Sept. 27, 1968, Ser. No. 808,029
Int. Cl. H01g 1/26, 9/16
U.S. Cl. 343—701 **2 Claims**

A dipole antenna connected across the input of a transistorized push-pull amplifier. The output of the amplifier

is applied to a conventional small RF receiver. A first embodiment includes a filter network connected to the antenna



for supplying bias voltage to the amplifier. A second embodiment includes a DC battery for supplying the bias.

3,594,798

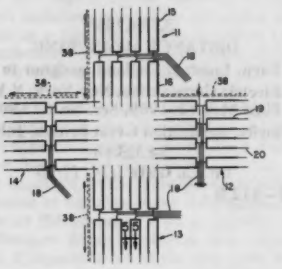
UNDERGROUND ANTENNA

George F. Leydorf, Birmingham, Mich., and Lucien W. Rawls, Leesburg, Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 77,587, Dec. 22, 1960. This application Mar. 9, 1966, Ser. No. 556,248

Int. Cl. H01q *1/04*

U.S. Cl. 343—719 **6 Claims**



The present invention relates in general to a hardened antenna, and in particular to a broadside array antenna which is placed at or below the surface of the ground, which is capable of withstanding the shock of explosions such as nuclear blasts.

3,594,799

VOR/DME, TACAN AND VORTAC HAVING INCREASED CAPABILITY

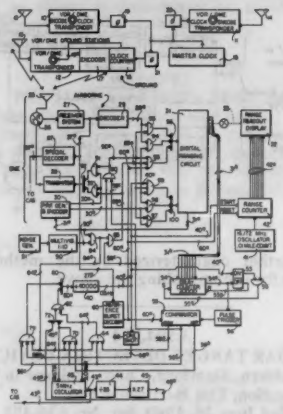
Lewis Michnik, Buffalo, N.Y., assignor to Sierra Research Corporation

Filed Sept. 10, 1969, Ser. No. 856,688

Int. Cl. G01s *9/56*

U.S. Cl. 343—6.5 LC **5 Claims**

A modified VOR/DME, TACAN or VORTAC system having ground stations synchronized to a master time and transmitting marker signals timed to a precise rate by the clock, and having a DME transponder; in combination with aircraft having standard DME cooperating with the ground DME to measure range by the round trip pulse technique, and the aircraft each having a local time clock and means to synchronize the time clock to the ground station clocks upon receipt of a marker signal by using the two-way DME measured range to compensate for marker signal transit time to the aircraft, and the aircraft including one-way range measuring and indicating means based on local synchronized clock time, and the aircraft further including means to render the clock synchronizing means and the two-way DME range measuring means operative only during brief intervals interspersed with much longer inoperative intervals, thereby to reduce the frequency of ground station DME interrogations



by each aircraft without reducing the rate of range data acquisition thereby.

3,594,800

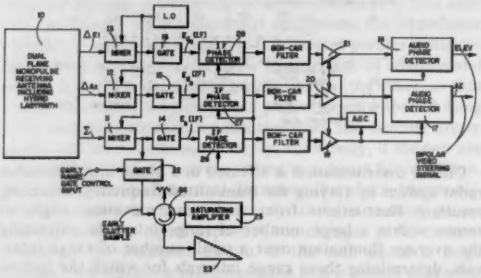
MOVING TARGET ANGLE TRACKING SYSTEM

William E. Stoney, Whittier, Calif., assignor to North American Rockwell Corporation

Filed July 21, 1966, Ser. No. 566,970

Int. Cl. G01s *9/42*

U.S. Cl. 343—7.7 **6 Claims**



Means for reducing marginal tracking conditions in a clutter-referenced, moving target tracking system of the monopulse type. An early ground return receiver signal is stored and stretched for use as a coherent reference in the coherent detection of received range trace signals, to provide clutter-referenced range trace signals. Such clutter-referenced signals may then be both doppler processed to distinguish a moving target component thereof, and further processed to provide angle-tracking signals having a sense indicative of the sense of direction of the detected moving target.

3,594,801

DIRECTION FINDER

John M. Smith, Salt Lake City, Utah, assignor to James E. Smith, Detroit, Mich.

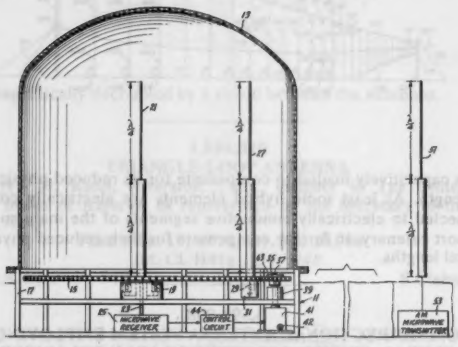
Filed July 15, 1969, Ser. No. 841,739

Int. Cl. G01s *3/44*

U.S. Cl. 343—117 **11 Claims**

The present invention relates to direction finding apparatus for determining the direction and/or distance to a

transmitter by moving a blocking antenna between a receiving antenna and a transmitter, physically to block energy radiated to the receiving antenna from the transmitter. The receiving antenna is connected to a receiver which applies energy in accordance with the received signal to a control circuit connected to drive a motor which moves the blocking antenna until it blocks the energy path from the transmitter. The control circuit is simply a null seeking circuit to stop the



motor when the received signal is at a null thereby aligning the two antennas in the direction of the transmitter. Two or more pairs of such antennas and associated apparatus will determine distance to the transmitter if the spacing between the pairs is known because the included angles are measured. Further, by orienting the antennas in a direction substantially parallel with the earth's surface, the apparatus can be used to follow a glide path for aircraft.

3,594,802

OMNIDIRECTIONAL ANTENNA HAVING CIRCUMFERENTIALLY SPACED RADIATORS WITH ORTHOGONAL POLARIZATION

Karl Koob, Munich, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn bei Munich, Germany

Filed Sept. 20, 1968, Ser. No. 761,198
Claims priority, application Germany, Sept. 22, 1967, P 15 91 008.4
Int. Cl. H01q *1/28*
U.S. Cl. 343—705 **5 Claims**

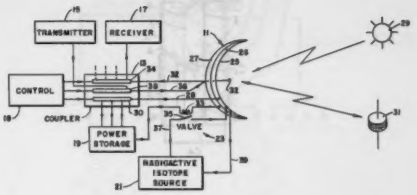
In an omnidirectional antenna of the type including plural individual radiators arranged around the circumferential periphery of a preferably cylindrical body whose diameter is large relative to the operating wave length of the antenna, the respective polarization directions of peripherally adjacent individual radiators are perpendicular to each other. The radiation patterns of the individual radiators overlap in the range of their respective half powers (3db-points). The antenna has a circular radiation characteristic formed by simple addition of the radiation patterns of the individual radiators.

3,594,803

INTEGRATED THERMOELECTRIC GENERATOR/SPACE ANTENNA COMBINATION

Gerald L. Pucillo, Braintree, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 29, 1968, Ser. No. 771,530
Int. Cl. H01q *1/28*; H01v *1/00*
U.S. Cl. 343—720 **4 Claims**



This disclosure describes an integrated thermoelectric generator/antenna. An antenna is formed of a sandwich of hot and cold thermoelectric elements, such as bismuth and tellurium. Power storage means are connected to the antenna to receive and store the power generated by the thermoelectric action between the elements. In addition, transmitting and receiving means are connected to the antenna so that the antenna transmits and receives signals. Further, a separate source of heat is connected to the "hot" thermoelectric element to provide an auxiliary source of heat for that element when the antenna is not receiving energy from a hot body.

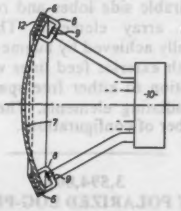
The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

3,594,804

ELECTRICALLY CONTROLLED REFLECTIVE SURFACE EMPLOYING FERRITE MATERIAL

Wolfgang Hersch, Thames Ditton, England, assignor to Electric & Musical Industries Limited, Hayes, England

Filed Aug. 21, 1968, Ser. No. 754,399
Claims priority, application Great Britain, Aug. 22, 1967, 38619/67
Int. Cl. H01q *19/06*
U.S. Cl. 343—754 **3 Claims**



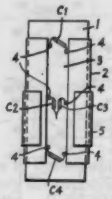
In a microwave system a microwave reflector is provided which is capable of selective displacement. The reflector is formed by a layer of ferrite material, and a nonferromagnetic microwave reflecting surface behind said layer. The selective displacement is produced by means for selectively inducing a magnetic field within said ferrite layer, the arrangement being such that changes in the magnetic condition of said ferrite layer cause said layer to change from a transoarent state to a reflecting state for microwave energy.

3,594,805

FERRITE ROD ANTENNA WITH LONGITUDINALLY SPLIT SLEEVE

Eric G. Chardin, Cambridge, England, assignor to Pye Limited, Cambridge, England

Filed Mar. 14, 1969, Ser. No. 807,277
Claims priority, application Great Britain, Mar. 25, 1968, 14,347/68
Int. Cl. H01q 7/08
U.S. Cl. 343—746 7 Claims



This invention relates to aerials comprising a ferrite rod disposed within a longitudinally split sleeve of electrically conducting material and where a substantially uniform capacitance exists or is provided across the split. According to this invention the resonant frequency of the aerial can be adjusted by varying the inductance of the split sleeve disposed around the ferrite rod.

3,594,806

DIPOLE AUGMENTED SLOT RADIATING ELEMENTS

Woodrow W. Black, Los Angeles, and Alvin Clavin, Calabasas, both of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 2, 1969, Ser. No. 816,480
Int. Cl. H01q 13/10
U.S. Cl. 343—771 11 Claims

The apparatus of the present invention enhances the performance of slot radiating elements or arrays, increasing the overall antenna gain, increasing the front to back signal ratio, suppressing undesirable side lobes and reducing the mutual coupling between array elements. This enhanced performance is generally achieved by augmenting the respective individual slots with exterior feed lines which form a transmission line transition to either free space or one or more dipole auxiliary radiating elements. The exterior elements can assume a number of configurations.

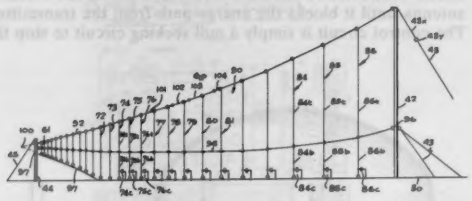
3,594,807

VERTICALLY POLARIZED LOG-PERIODIC-LIKE ANTENNA WITH MINIMAL TOWER HEIGHT

Robert L. Tanner, Palo Alto, Calif., assignor to Technology For Communications International, Mountain View, Calif.

Filed July 7, 1969, Ser. No. 839,305
Int. Cl. H01q 11/10, 21/12, 1/14
U.S. Cl. 343—792.5 22 Claims

A vertically polarized broadband antenna including a log-periodiclike array of elements, providing the high gain at the higher frequencies, characteristic of a conventional dipole-type vertically polarized log-periodic antenna, and reduced antenna height characteristic of a conventional monopole-type vertically polarized log-periodic antenna. The log-periodiclike array includes conventional dipoles at the array front end and hybrid-type elements towards the array back end. Each hybrid element has a physical length less than λ/2 of its designed frequency of resonance. Each hybrid element



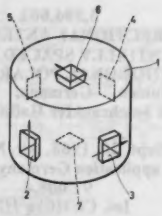
is capacitively loaded to compensate for its reduced physical length. At least some hybrid elements are electrically connected to electrically conductive segments of the main support catenary, to further compensate for their reduced physical lengths.

3,594,808

OMNIDIRECTIONAL ANTENNA SYSTEM EMPLOYING PLURAL, SPACED, PERPENDICULARLY POLARIZED RADIATORS

Karl Koob, Muenchen, and Joachim Hermann, Duerrnhaar, both of, Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Apr. 14, 1970, Ser. No. 28,461
Claims priority, application Germany, May 28, 1969, P 19 27 146.6
Int. Cl. H01q 1/28, 21/20
U.S. Cl. 343—799 6 Claims



An omnidirectional antenna includes several individual radiators which are arranged on the superficies of a preferably cylindrical body which has a diameter which is relatively great in comparison to the operative wavelength of the antenna. Adjacent individual radiators are polarized perpendicularly to each other and are overlapping in the range of their half power (3db. point). At least two additional individual radiators are provided at each median perpendicular of the plane given by the individual radiators which are arranged on the superficies and on the outer surface of the body and they are polarized perpendicularly relative to the adjacent individual radiators.

3,594,809

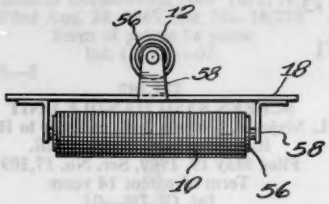
CROSSED LOOP ANTENNAS WITH SEPARATING SHIELD

Rinaldo E. De Cola, Park Ridge, and Alicja D. Kulbiej, Chicago, both of, Ill., assignors to Warwick Electronics Inc.

Filed Oct. 29, 1968, Ser. No. 771,577
Int. Cl. H01q 7/08, 1/52
U.S. Cl. 343—841 11 Claims

An omnidirectional antenna system having two loop anten-

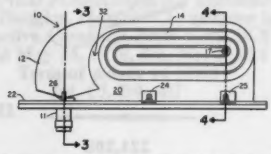
nas disposed at right angles to each other and electrically and magnetically decoupled by a shield between the antennas.



3,594,810
TRIANGLE-LOOP ANTENNA

Cyril M. Kaloi, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 18, 1970, Ser. No. 20,766
Int. Cl. H01g *1/36, 1/48*
U.S. Cl. 343—848 **8 Claims**



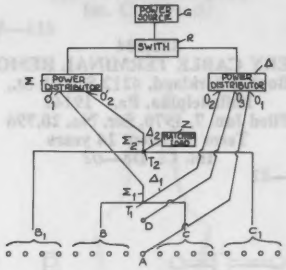
An antenna for receiving three widely separated frequency bands; the antenna beginning with a triangular tapered section fed by a coaxial line and continuing with several loops terminated in the center at ground.

3,594,811
SUM AND DIFFERENCE ANTENNA

Robert L. Pierrot, Paris, France, assignor to Thomson-CSF

Filed Feb. 7, 1969, Ser. No. 797,519
Claims priority, application France, Feb. 9, 1968, 139,374
Int. Cl. H01g *3/26, 3/24, 21/00*
U.S. Cl. 343—854 **3 Claims**

The radiation elements of an antenna comprising a linear array of elements and a further compensation element are fed so that the radiation pattern of a central portion of the linear array is in quadrature of phase with the radiation pattern of the remaining elements of the array, for the formation of a nondirective pattern covering the secondary lobes of the directive pattern obtained through an in-phase feeding of the elements of the linear array.



3,594,812
STRIP LINE FERRITE PHASE SHIFTER

Daniel C. Buck, Hanover; Theodore M. Nelson, Catonsville; Robert A. Moore, Severna Park, Md., and Leonard Dubrowsky, East Meadow, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

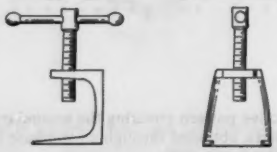
Filed July 17, 1969, Ser. No. 842,447
Int. Cl. H03h *7/36;* **H01p** *3/08;* **H01q** *3/26*
U.S. Cl. 343—854 **13 Claims**

Described is a small, lightweight ferrite phase shifter, constructed in a strip line wave energy transmission assemblage, which is small enough to fit into a steerable antenna array while at the same time providing good electrical isolation between adjacent phase shifters in the array.

DESIGNS

JULY 20, 1971

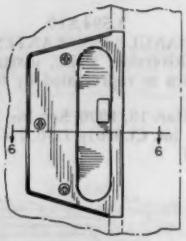
221,204
BATTERY CABLE TERMINAL REMOVER
Boykin Kirkland, 4212 S. 87th St., Philadelphia, Pa. 19142
Filed Jan. 7, 1970, Ser. No. 20,796
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—51



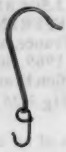
221,205
ELECTRIC DRILL
Knut Otto Yran, Eindhoven, Netherlands, assignor to U.S. Philips Corporation
Filed Feb. 9, 1970, Ser. No. 21,326
Claims priority, application Switzerland Aug. 18, 1969
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—68

221,206
ELECTRIC DRILL
Knut Otto Yran, Eindhoven, Netherlands, assignor to U.S. Philips Corporation
Filed Feb. 9, 1970, Ser. No. 21,338
Claims priority, application Switzerland Aug. 18, 1969
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—68

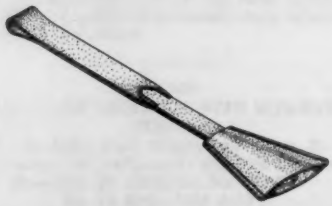
221,207
SCREEN SASH HANDLE UNIT
Henry L. Majeske, Goshen, Ind., assignor to Homeshield Industries Inc., Elmhurst, Ill.
Filed May 19, 1969, Ser. No. 17,209
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—150



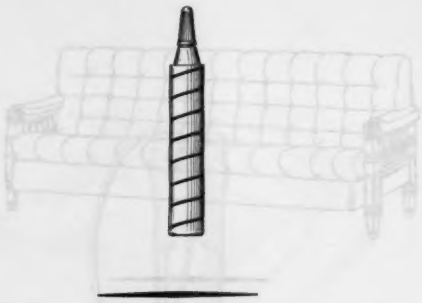
221,208
ARTICLE-SUPPORT SHOULDER BRACKET
Clifford C. Richey, Scottsdale, Ariz., assignor to Richey's, Incorporated, Des Moines, Iowa
Filed Dec. 16, 1969, Ser. No. 20,524
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—154



221,209
GARMENT BAG CARRIER
Richard C. Moore, 8023 N. 38th Ave., Phoenix, Ariz. 85021
Filed May 8, 1970, Ser. No. 22,885
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—154



221,210
SQUEEZE BOTTLE FOR PAINT OR THE LIKE
Benjamin Weiner, Stamford, Conn., assignor to Grow Chemical Corporation, New York, N.Y.
Filed Aug. 20, 1969, Ser. No. 18,778
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2



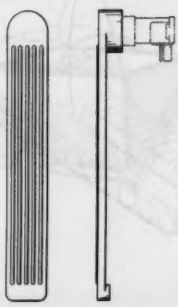
221,211
COMBINED JUG AND CAP THEREFOR
Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed May 15, 1970, Ser. No. 23,014
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—42

221,212
COMBINED BOTTLE AND CAP THEREFOR
Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed May 15, 1970, Ser. No. 23,015
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—89

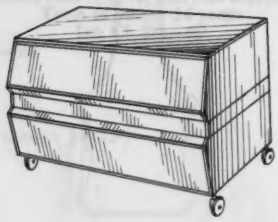
221,213
BOTTLE
Richard L. Weckman, 202 W. 7th, Perrysburg, Ohio 43551
Filed July 17, 1970, Ser. No. 24,001
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111

221,214
FORCING BAG
John MacManus, 143—16 Twenty-second Road, Whitestone, N.Y. 11357
Filed Feb. 19, 1970, Ser. No. 21,504
Claims priority, application Great Britain Aug. 27, 1969
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—194

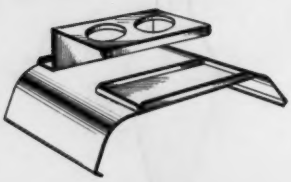
221,215
DIMMER SWITCH PEDAL
Paul J. Hunckler, Huntington, Ind., assignor to Hunckler Products, Inc., Roanoke, Ind.
Filed Mar. 12, 1969, Ser. No. 16,197
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—6



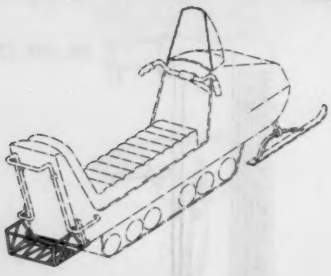
221,216
INSTITUTIONAL FOOD SERVER
E. Burton Benjamin, Highland Park, and Richard Sylvan, Glenview, Ill., assignors to Carter-Hoffmann Corp.
Filed Jan. 30, 1970, Ser. No. 21,162
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—6



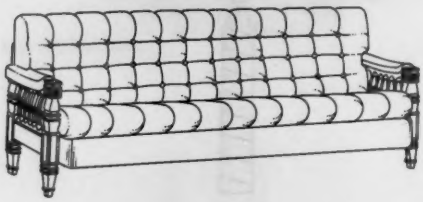
221,217
CAR TRAY
Samuel Beychok, 8406 W. Wilderness Way
Shreveport, La. 71106
Filed Apr. 30, 1970, Ser. No. 22,725
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—6



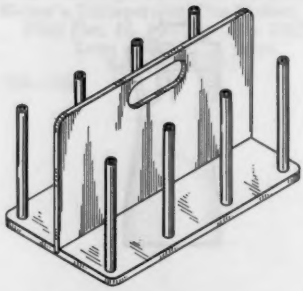
221,218
SNOW MACHINE CARRIER
Richard H. Camp, Box 62, Haines, Oreg. 97833
Filed Feb. 19, 1970, Ser. No. 21,601
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—24



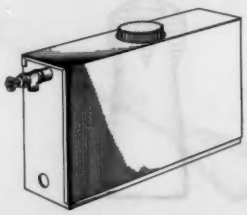
221,219
SOFA
Thomas Winrow, 530 S. Sleight St.,
Naperville, Ill. 60540
Filed Nov. 30, 1970, Ser. No. 26,219
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—11



221,220
BACTERIOLOGICAL DISH RACK
Ronald W. Emmitt, Farmington, Mich., assignor to Emmitt Scientific, Inc., Farmington, Mich.
Filed Nov. 24, 1969, Ser. No. 20,265
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1



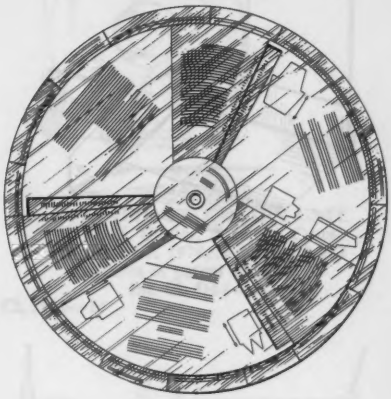
221,221
WATER HEATER
Elmer G. Heinrich, 3234 S. Akron,
Denver, Colo. 80222
Filed Apr. 25, 1969, Ser. No. 16,890
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—86



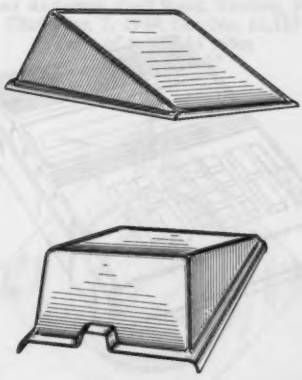
221,222
DENTAL JET CLEANSING UNIT
Raymond Leonard Flatray, 2480 S. Osceola St., Denver, Colo. 80219
Filed May 18, 1970, Ser. No. 23,038
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1

221,223
HOLDER FOR PROCESSING A DENTAL FACING
Claude M. Pickands, Oak Forest, Ill., assignor to Alexander B. Pickands, Chicago, Ill.
Filed Apr. 8, 1970, Ser. No. 22,316
Term of patent 7 years
Int. Cl. D24—*03*
U.S. Cl. D24—1

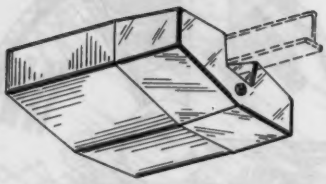
221,224
SWEATER INSTRUCTION WHEEL
Beatrice L. Freeman, 113 Clemson Road, Bryn Mawr, Pa. 19010
Filed Dec. 5, 1969, Ser. No. 20,382
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1



221,225
PORTABLE LEVELER AND SUPPORT FOR THE TOP OF A TILTED TEST INSTRUMENT
Robert N. Rehlaender, 149 Cervantes Road, Redwood City, Calif. 94062
Filed Apr. 11, 1969, Ser. No. 16,703
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D26—1



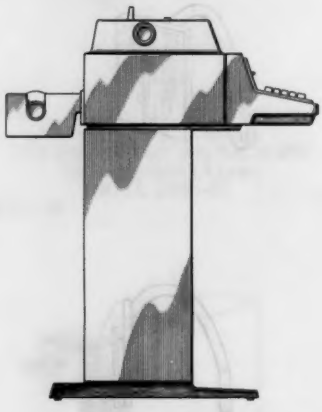
221,226
GARAGE DOOR OPERATOR HOUSING
Giacinto C. Dercoli, Park Forest, Ill., assignor to The Alliance Manufacturing Company, Inc.
Filed Jan. 26, 1970, Ser. No. 21,121
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5



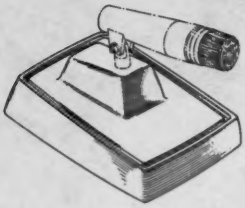
221,227
DESK TOP ELECTRONIC CALCULATOR
Gerhard Dietrich, Furth, Bavaria, and Peterheinz Meyer, Unterasbach, Bavaria, Germany, assignors to Triumph Werke Nuernberg A.G., Nuremberg, Germany
Filed May 8, 1970, Ser. No. 22,889
Claims priority, application Germany Nov. 24, 1969
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

221,228
KEYBOARD FOR A COMPUTER OR THE LIKE
Larry D. Harrison, Newark, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 22, 1970, Ser. No. 23,103
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

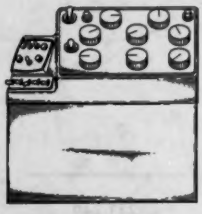
221,229
SEND/RECEIVE DATA PRINTER TERMINAL
Robert H. Van Valkinburgh, Pittsford, and Robert A. Clowe, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 20, 1970, Ser. No. 23,109
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



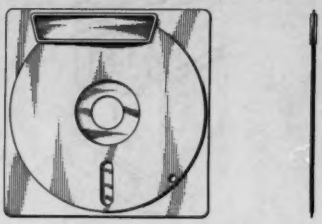
221,230
MICROPHONE STAND
Robert L. Deschamps, West Chicago, Ill., assignor to Shure Brothers Incorporated
Filed Nov. 3, 1969, Ser. No. 19,886
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



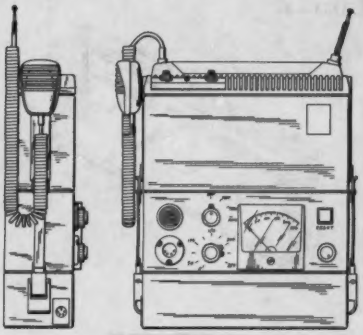
221,231
MOTOR VEHICLE MOUNTED ELECTRICAL COMMUNICATION UNIT OR SIMILAR ARTICLE
Philip L. Brooks, Menlo Park, Calif., assignor to Sylvania Electric Products Inc.
Filed Apr. 2, 1970, Ser. No. 22,218
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



221,232
MAGNETIC DISK CARTRIDGE
Clifford I. Dawson and Dallas G. Molerin, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 10, 1969, Ser. No. 20,017
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—14

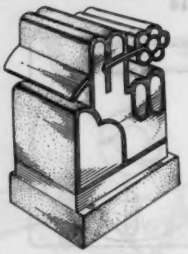


221,233
PORTABLE TELEMETRY UNIT
Robert J. Huszar, Hartford, Conn.
Filed May 7, 1970, Ser. No. 22,882
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



221,234
PLAQUE
Bert Rodney Anderson, Golf Road, Reading, Pa. 19601
Filed Mar. 7, 1969, Ser. No. 16,127
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

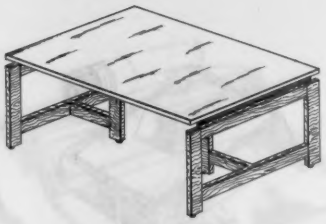
221,235
STATUETTE
Joseph J. Sands, 8501 Limerick Ave., Canoga Park, Calif. 91306
Filed Apr. 20, 1970, Ser. No. 22,509
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23



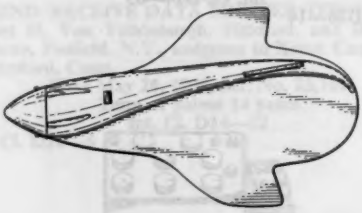
221,236
BEAD, NECKLACE AND EARRING HOLDER
Martha S. Fowler, 594 Beatrice St., San Leandro, Calif. 94579
Filed Aug. 21, 1969, Ser. No. 18,795
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3

221,237
HOLDER FOR TAPE CASSETTES OR SIMILAR ARTICLE
Maxwell H. Connan, 53 Roosevelt Ave., Glen Head, N.Y. 11545
Filed Apr. 22, 1970, Ser. No. 22,565
Term of patent 14 years
Int. Cl. D6—*01, 99*
U.S. Cl. D33—3

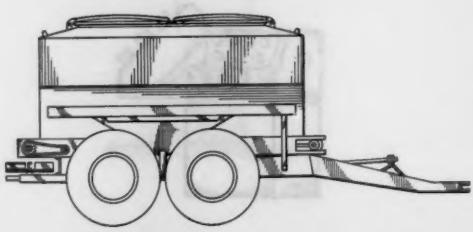
221,238
TABLE
John L. Gianfagna, 102 Crestwood Circle, Marietta, Ohio 45750
Original design application July 17, 1968, Ser. No. 12,808. Divided and this application May 13, 1969, Ser. No. 19,395
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14



221,239
AERIAL TOY
David William Main, 1252 Columbia St., Denver, Colo. 80206
Filed Mar. 9, 1970, Ser. No. 21,789
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

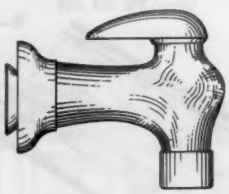


221,240
PARTICULATE MATERIAL SPREADER
Loren E. Tyler, Wayzata, Minn., assignor to Mobility, Inc., Long Lake, Minn.
Filed Sept. 2, 1969, Ser. No. 18,969
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D35—2

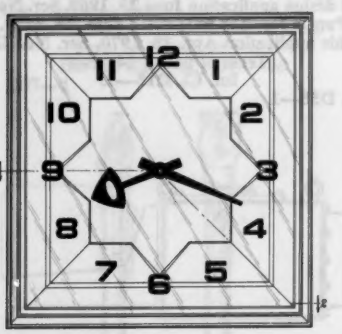


221,241
ANIMAL FIGURE DOLL
Anthony Chrones, 52 Wood Haven Blvd., North Providence, R.I. 02908
Filed May 25, 1970, Ser. No. 23,127
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—2

221,242
NOVELTY AND AMUSEMENT DEVICE
William A. McMillan, Los Angeles, Calif., assignor to H. Fishlove & Co., Chicago, Ill.
Filed Apr. 29, 1970, Ser. No. 22,706
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D34—15

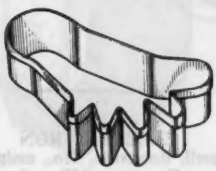


221,243
CLOCK
Gordon T. Guth, Evanston, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Mar. 4, 1970, Ser. No. 21,739
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

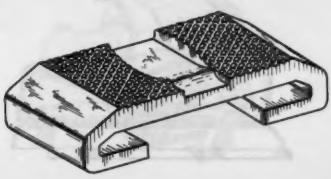


221,244
CULINARY SCRAPER OR SIMILAR ARTICLE
Paul A. Lawrence, 1660 Beaver Ave., Des Moines, Iowa 50310
Filed Apr. 27, 1970, Ser. No. 22,649
Term of patent 7 years
Int. Cl. D7—*99*
U.S. Cl. D44—1

221,245
COOKIE CUTTER
Dorothy E. Jordan, Austin, Minn. 55912
Filed May 18, 1970, Ser. No. 23,050
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—1

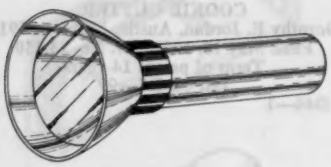


221,246
LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Yuen Sang Poon, 36 Kam Wah St., Hong Kong
Filed Apr. 24, 1970, Ser. No. 22,631
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4

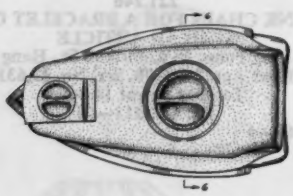


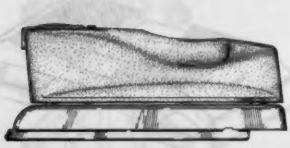
221,247
DENTAL OPERATING LIGHT
Daryl Raymond Beach and Sadayasu Ota, Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan
Filed Mar. 13, 1970, Ser. No. 21,896
Claims priority, application Japan Sept. 19, 1969
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20

221,248
FLASHLIGHT CASING
Rene Marcel Angibaud, Vernon, Eure, France, assignor to Societe Les Piles Wonder, Saint-Ouen, Seine-Saint-Denis, France
Filed Feb. 6, 1970, Ser. No. 21,319
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—24

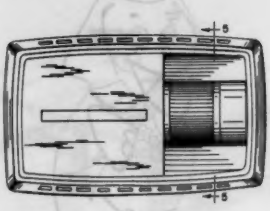


221,249
ELECTRIC IRON
Eugene R. Russell, Boonville, Mo., assignor to McGraw-Edison Company, Milwaukee, Wis.
Filed Apr. 2, 1970, Ser. No. 22,211
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—6

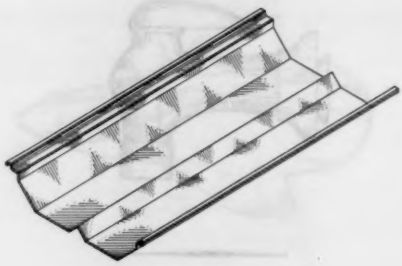




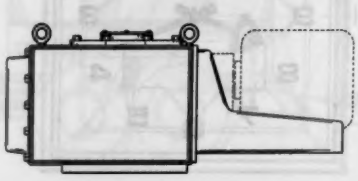
221,250
WALL THERMOSTAT
Frederick M. Hill, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio
Filed Mar. 30, 1970, Ser. No. 22,097
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D52—7



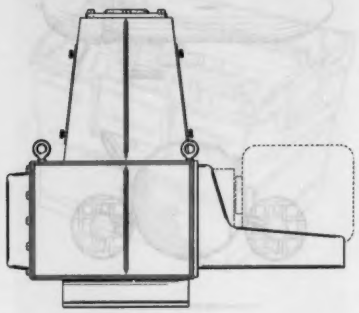
221,251
PATIO COVER PANEL PAN
Arthur E. Haskell, Downey, William N. Brummet, Burbank, and Robert Fitzgerald, Huntington Beach, Calif., assignors to State Industries, Huntington Park, Calif.
Filed Mar. 13, 1970, Ser. No. 21,893
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D54—2



221,252
MIXER FOR LIQUIDS OR THE LIKE
John J. Hughes, Jr., 3027 N. Marietta Ave., Milwaukee, Wis. 53211
Original design application June 23, 1969, Ser. No. 17,809, now Patent No. 218,853, dated Sept. 29, 1970. Divided and this application Apr. 28, 1970, Ser. No. 22,692
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1



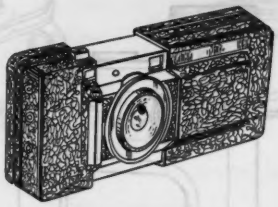
221,253
MIXER FOR LIQUIDS OR THE LIKE
John J. Hughes, Jr., Milwaukee, Wis., assignor to Mixing Equipment Co., Inc., Rochester, N.Y.
Original design application June 23, 1969, Ser. No. 17,808, now Patent No. 218,852, dated Sept. 29, 1970. Divided and this application Apr. 29, 1970, Ser. No. 22,703
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1



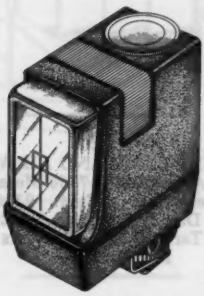
221,254
PIANO
Winsor D. White, Jr., Blowing Rock, N.C., assignor to D. H. Baldwin Company, Cincinnati, Ohio
Filed Feb. 24, 1970, Ser. No. 21,584
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9

221,255
OPHTHALMOSCOPE
Helmut A. Heine, Herrsching, Upper Bavaria, Germany, assignor to Optotechnik G.m.b.H. and Propper Manufacturing Company, Inc.
Filed June 12, 1970, Ser. No. 23,465
Term of patent 14 years
Int. Cl. D24—*02*; D16—*08*
U.S. Cl. D57—1

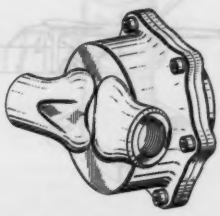
221,256
CAMERA
Masahiro Fukuda, Kawasaki-shi, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Kanagawa-ken, Japan
Filed Aug. 23, 1968, Ser. No. 13,242
Claims priority, application Japan Mar. 30, 1968
Term of patent 14 years
The portion of the term of the patent subsequent to Apr. 8, 1983, has been disclaimed
Int. Cl. D16—*03*
U.S. Cl. D61—1



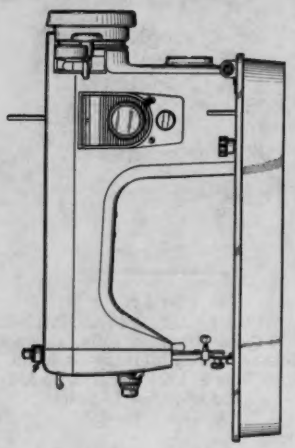
221,257
CAMERA FLASH ATTACHMENT
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed June 5, 1970, Ser. No. 23,331
Term of patent 14 years
Int. Cl. D16—*07*
U.S. Cl. D61—1



221,258
PUMP
Harry J. Saddler, St. Paul, Minn., assignor to Hypro, Inc., New Brighton, St. Paul, Minn.
Filed Jan. 9, 1970, Ser. No. 20,852
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1

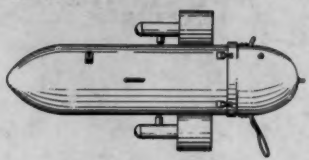


221,259
SEWING MACHINE
Yasuaki Yamamoto, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd.
Filed Oct. 28, 1969, Ser. No. 19,773
Claims priority, application Japan May 28, 1969
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D70—1



221,260
COMBINED LAND AND AIR VEHICLE
Henry A. Smolinski, 7860 Mesa Drive, Santa Susana, Calif. 93063
Filed Dec. 3, 1969, Ser. No. 20,470
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D71—1

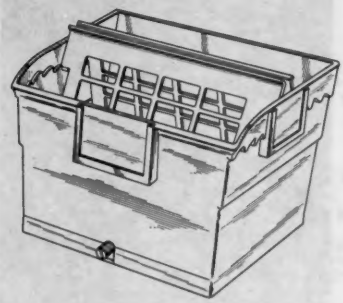
221,261
UNDERWATER TOWING APPARATUS
Eugene J. Tallarico, 173 Bleecker St., New York, N.Y. 10012
Filed Mar. 5, 1970, Ser. No. 21,754
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D71—1



221,262
SURF BOARD
Janet L. Marshall, 219 Monte Vista Ave., Costa Mesa, Calif. 92626
Filed Apr. 24, 1970, Ser. No. 22,639
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D71—1

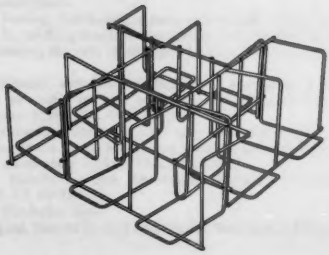
221,263
PARKING SIGNAL STANDARD
Jerry C. Moore, 5018 Pershing, Houston, Tex. 77033
Filed Jan. 8, 1970, Ser. No. 20,825
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1

221,264
CARD FILE TRAY OR THE LIKE
William Malcolm Brown, Stroud, England, assignor to The Copeland-Chatterson Company Limited, Stroud, England
Filed Nov. 25, 1969, Ser. No. 20,269
Claims priority, application Great Britain Sept. 22, 1969
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—2

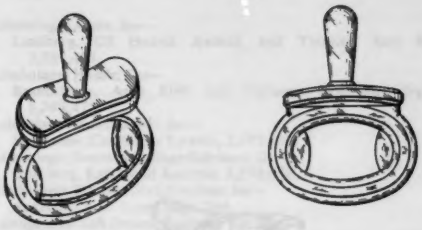


221,265
MECHANICAL PENCIL
Noboru Wakai, Tokyo, Japan, assignor to Dainihon Bungu Kabushiki Kaisha, also trading as The Japan Stationery Co., Ltd.
Filed Jan. 22, 1970, Ser. No. 21,028
Claims priority, application Japan July 31, 1969
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—24

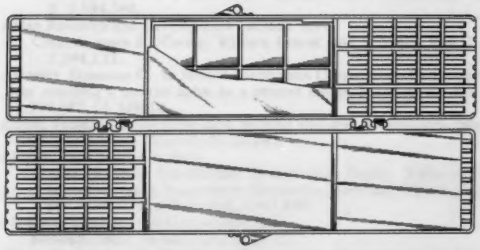
221,266
STORAGE AND DISPLAY UNIT FOR TAPE OR FILM CARTRIDGES OR THE LIKE
Henry V. Ivory, Chatham, N.J., assignor to Boorum & Pease Company, Brooklyn, N.N.Y.
Filed Nov. 3, 1969, Ser. No. 19,907
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—10



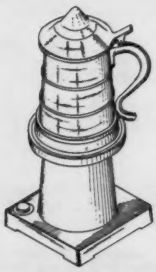
221,267
BABY TEETHER, PACIFIER AND GUM SOOTHER
Murry Herbst, 266—16 78th Ave., Floral Park, N.Y. 11004
Filed Mar. 11, 1970, Ser. No. 21,864
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—8



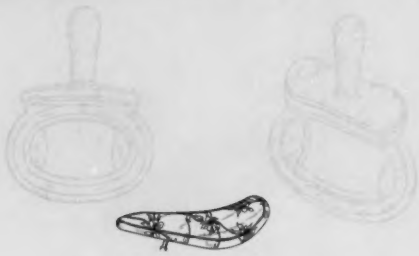
221,268
FISHING TACKLE BOX OR SIMILAR ARTICLE
Derrick Heaton, Irondequoit, N.Y. (409 Norcrest Drive, Rochester, N.Y. 14617)
Filed Mar. 13, 1969, Ser. No. 16,232
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



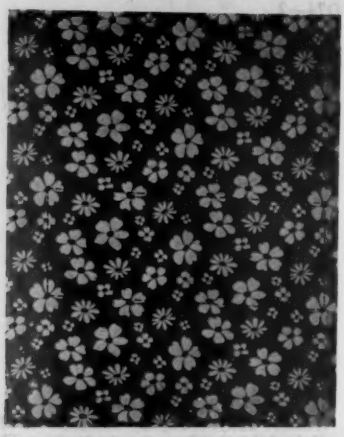
221,269
BLENDER
Raymond J. Evans, Fairfield, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed June 1, 1970, Ser. No. 23,228
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D89—1



221,270
BICYCLE SEAT COVER
Albert J. Fritz, Wilmette, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.
Filed Mar. 13, 1970, Ser. No. 21,891
Term of patent 14 years
Int. Cl. D5—*02;* D12—*14*
U.S. Cl. D90—16



221,271
TEXTILE FABRIC
Edward C. Taiman, Tarrytown, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,393
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D92—1



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Beightol, Leroy E., to Solar Laboratories, Inc. Electrical thermometer. 3,593,581, Cl. 73-362.
Belkin, Vitaly Rafailovich: *See—*
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Bleuer, Keith T. Pen. 3,594,091, Cl. 401-107.

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Bockmann, Walter: *See—*
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Bolles, Milton M., to Deering Milliken Research Corporation. Apparatus for processing sheet material. 3,593,939, Cl. 242-75.5

Boltic, Charles. Spray gun attachment. 3,593,921, Cl. 239-318.

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Bramlett, Glenn D., to Narad, Inc. Reinforced load spacer. 3,593,671, Cl. 105-369.

Brandli, Hanspeter; and Dandliker, Rene, to Institut fur Angewandte Physik der Universitat. Device for the frequency stabilization of a gas laser oscillator. 3,594,659, Cl. 331-94.5

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Braner, Harold R.: *See—*
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Bresee, Heber J., to Tektronix, Inc. Monolithic integrated circuit including field effect transistors and bipolar transistors, and method of making. 3,594,241, Cl. 148-175.

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Bresson, Eugene J. M., to Compagnie Generale d'Electricite. Measurement of the density of a fluid. 3,593,585, Cl. 73-453.

Bretti, Franco, to Olivetti, Ing., C., & C., S.p.A. Device for supporting and guiding a roll of paper in a calculating, accounting or like machine. 3,593,833, Cl. 197-132.

Brico Engineering Limited: *See—*
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Broodman, Johannes Jacobus, to N.V. Koninklijke Maatschappij 'De Schelde'. Method of moulded welding with consumable nozzle. 3,594,538, Cl. 219-73.

Broussard, Leo P., Sr., to Shell Oil Company. Method and apparatus for drilling and producing wells in a formation susceptible to compaction. 3,593,795, Cl. 166-285.

Brouwer, Charles W.; Bucheister, Henry C.; and Tata, Raymond V., to Leesona Corporation. Bobbin handling apparatus. 3,593,896, Cl. 222-450.

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Brown, Cicero C.; and Cochran, Chudleigh B., said Cochran assor. to Brown Oil Tools, Inc. Anchor assembly for well tools such as packers and the like. 3,593,784, Cl. 166-125.

Brown, Dwight C. Method of making a pallet. 3,593,407, Cl. 29-416.

Brown, Earl R. Portable food dispenser. 3,593,888, Cl. 222-146.

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Brownlee, Thomas Harland, to American Cynamid Company. Synthesis of new NF compounds. 3,594,385, Cl. 260-290.

Broyde, Barret, to Western Electric Company, Incorporated. Additives to negative photoresists which increase the sensitivity thereof. 3,594,170, Cl. 96-36.

Bruch, Charles A., to General Electric Company. Sputter coating apparatus. 3,594,301, Cl. 204-298.

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Budinger, William D. Hickey roller and method. 3,594,255, Cl. 156-425.

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Buerki, Christian E., to Norris Industries, Inc. Electric cooktop with a removable spill-over device. 3,593,653, Cl. 99-446.

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Bukanova, Valentina Ivanovna: *See—*
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Bustin, Leopold. Interlocking channel sections for use in the construction of floors, ceilings, walls and the like. 3,593,468, Cl. 52-27.

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Cameron, Antony D., to Aberdeen Engineering Design Limited. Device for separating particulate material from a mixture of particulate material and fluid. 3,593,501, Cl. 55-338.

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Carlstedt, Ragnar L.; and Smith, Emlyn N., said Carlstedt assor. to Kennametal Inc. Tire stud having light-weight wear-resistant. 3,593,771, Cl. 152-210.

Carman, Jerry K.; and Meredith, Ronald E. Work-positioning devices. 3,593,984, Cl. 269-71.

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Francis, John P. Combined awning and case structure. 3,593,470, Cl. 52-36.

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Mollet, Samuel J., III; and Friedrichsen, Thomas, to Massillon-Cleveland-Akron Sign Company, The. Pole banner sign construction. 3,593,450, Cl. 40-145.

Monestere, Martin, Jr.; and Vaillancourt, Vincent L., to Bard, C. R., Inc. Drainage bag. 3,593,765, Cl. 150-1.

Monner, Ray J., to Parr Instrument Co. Adiabatic calorimeter control system. 3,593,577, Cl. 73-190.

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Monroe, Edwin P. Suspension device. 3,594,040, Cl. 297-307.

Monsanto Company: *See—*
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Montelius, Carl Oscar Torsten, to Aktiebolaget Imo-Industri. Pump unit. 3,593,893, Cl. 222-333.

Moor, Herman L.; Braner, Harold R.; and Salk, Irwin L., to Braner Engineering, Inc. Lift mountable to the bed of a pick-up truck. 3,593,865, Cl. 214-86.

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Morane, Bruno Pierre, to L'Oreal. Valve for simultaneously dispensing a plurality of fluids. 3,593,886, Cl. 222-136.

Morane, Bruno P., to L'Oreal. Valve for dispensing a plurality of products packaged under pressure. 3,593,887, Cl. 222-136.

Morane, Bruno, to L'Oreal. Mixing and dispensing cap. 3,593,964, Cl. 259-4.

Morane, Bruno, to L'Oreal. Device for mixing a plurality of fluids which are to be simultaneously dispensed. 3,593,965, Cl. 259-4.

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Morgenegg, Fritz. Angularly adjustable holder for machine-tool bits. 3,594,537, Cl. 219-69.

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Morris, Raymond L. Guidance system for dual-mode vehicle. 3,593,667, Cl. 104-120.

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Mueller, Guenther, to Ciba Corporation. Granular material containing oily or liquid therapeutically usable furanosides, a process for its manufacture, and its use for the manufacture of tablets or dragees. 3,594,474, Cl. 424-180.

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Mueller-Tamm, Heinz; and Frielingsdorf, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of non-plane building components composed of thermoplastic and metal layers. 3,594,249, Cl. 156-199.

Mueller-Tamm, Heinz; Mahling, Dieter; Frielingsdorf, Hans; and Hofmann, Alfred, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of plane building components comprising a thermoplastic innerlayer with metal outer plies. 3,594,250, Cl. 156-244.

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Murgas, Karl M.; Greenberg, Burton; and Clark, Otto Anthony, to ICP, Inc. Book copier with movable carrier. 3,594,079, Cl. 355-8.

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Schonbrodt, Horst; and Listing, Volkmar, to Jungheimrich, H., & Co., Maschinenfabrik. Vehicular guidance system with collision prevention. 3,594,571, Cl. 246-66.

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Serkov, Anatoly Gavrilovich; Grinchenko, Dmitry Nikitovich; Moiseev, Vasily Sergeevich; Maslovsky, Gennady Vasilievich; and Alexeev, Igor Petrovich. Drumless-type vertical water-tube natural circulation boiler. 3,593,690, Cl. 122-235.

Sernovitz, Morton A. Signal device. 3,593,681, Cl. 116-63.

Servetnick, Harold J. Film cartridge. 3,593,635, Cl. 95-31.

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Seybert, Earl K.; and Link, Philip W., to Grace, W. R., & Co. Binder for thin layer chromatographic adsorbents. 3,594,217, Cl. 117-119.6

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Yamane, Mitsunori; and Hayashi, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Control device for reed switch. 3,594,669, Cl. 335-207.

Yamashita, Hajime, to Kabushiki Kaisha Ricoh. Roll microfilm and retrieving device and method of retrieving. 3,594,581, Cl. 250-219.

Yano, Shinkichi. Joint for preventing slip-off of pipes. 3,594,023, Cl. 285-337.

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Zitzow, Ewald L. Collapsible grapnel anchor. 3,593,682, Cl. 114-208.

Zurheide, George B.; and Harvey, Frank E., to PPG Industries, Inc. Crane apparatus with hoist means located between spaced platforms. 3,593,869, Cl. 214-658.

Zygmunt, Walter Anthony; and Browder, Henry Polk, to Mead Johnson & Company. Lysostaphin fermentation with accelerated time cycle. 3,594,284, Cl. 195-96.

LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Abel, Edward P., and L. M. Minsk. Flexible film-forming polymers capable of insolubilization. T888,010, 7–20–71, Cl. 260—72.

Cambron, Robert B., and L. E. Ott, to Caterpillar Tractor Co. Piston ring and groove. T888,014, 7–20–71, Cl. 277—138.

Dappen, Glen M., and T. E. Whiteley. Photographic silver halide emulsions having increased covering power. T888,005, 7–20–71. Cl. 96—94.

Drake, George M., Jr., to E. I. du Pont de Nemours and Co. Composite film structure and method of making it. T888,001, 7–20–71, Cl. 156—306.

Du Pont de Nemours, E. I.: *See*
Drake, George M., Jr. T888,001.
Hughes, Charles T. T888,002.

Elins, Herbert S. Photographic films having carbon-containing backing layers. T888,012, 7–20–71, Cl. 96—87.

Foster, Donald P.: *See*
Yackel, Edward C., and Foster. T888,017.

Gilman, Paul B. Electrophotographic speed of inorganic photoconductors is increased by the addition of organic photoconductors. T888,013, 7–20–71, Cl. 96—1.5.

Haley, Michael J. H., and B. J. Oakley, to Imperial Chemical Industries Ltd. Sealing jaws for packaging machines. T888.003, 7–20–71, Cl. 156—515.

Hughes, Charles T., to E. I. du Pont de Nemours and Co. Process for dyeing aromatic polyamide fibers from a phosphate surfactant benzaldehyde containing dyebath and composition therefor. T888,002, 7–20–71, Cl. 8—171.

Imperial Chemical Industries Ltd.: *See*—
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Kalenda, Norman W. Supersensitized photographic silver halide emulsions. T888,015, 7–20–71, Cl. 96—124.

Kalenda, Norman W. Photographic materials. T888,016, 7–20–71. Cl. 96—126.

Keller, William R. Minimizing differential shrinkage of multilayer ceramic circuit boards. T888,004, 7–20–71, Cl. 156—89.

Laakso, Thomas M.: *See*—
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MacDonald, William A., Jr. Positioning mechanism. T888,008, 7–20–71, Cl. 355—45.

Minsk, Louis M.: *See*—
Tuites, Richard C., Laakso, Williams, and Minsk. T888,007.
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Morie, Gerald P. Tobacco smoke filter. T888,006, 7–20–71, Cl. 131—266.

Oakley, Barry J.: *See*—
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Scott-Cook, Robert L. Production of thermoplastics articles. T888,009, 7–20–71, Cl. 156—62.4.

Stauffer, Robert E. Receiving sheet for photographic diffusion transfer. T888,011, 7–20–71, Cl. 96—76.

Tuites, Richard C., T. M. Laakso, J. L. R. Williams, and L. M. Minsk. Photo-sensitive polymers. T888,007, 7–20–71, Cl. 96—115.

Whiteley, Thomas E.: *See*—
Dappen, Glen M., and Whiteley. T888,005.

Williams Jack L. R.: *See*—
Tuites, Richard C., Laakso, Williams, and Minsk. T888,007.

Yackel. Edward C., and D. P. Foster. Coating of silver halide dotwise. T888,017, 7–20–71, Cl. 96—94.

LIST OF REISSUE PATENTEES

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Broderick, David C., to Metcom, Inc. Gaseous-solid state power limiter having a self-biasing circuit for the solid state device. Re. 27,154, 7–20–71, Cl. 333—13.

Hansen, Gerhard. Moulding and sealing machines. Re. 27,155,

Hedgewick, Peter, to Reflex Corp. of Canada Ltd. Safety cap and container. Re. 27,156, 7–20–71, Cl. 215—9.

Herold, Henry L., and J. Weizenbaum, to Honeywell Information Systems Inc. Apparatus in data processing system for coordinating memory communication among processors and peripheral devices. Re. 27,157, 7–20–71, Cl. 340—172.5.

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Beach, Daryl R., to Kabushiki Kaisha Morita Seisakusho. Dental operating light. 221,247, 7–20–71, Cl. D48—20.

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Dietrich, Gerhard, and P. Meyer, to Triumph Werke Nuernberg A.G. Desk top electronic calculator. 221,227, 7–20–71, Cl. 26—5.

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Haskell, Arthur E., W. N. Brummet, and R. Fitzgerald, to State Industries. Patio cover panel pan. 221,251, 7–20–71, Cl. D54—2.
Heaton, Derrick. Fishing tackle box or similar article. 221,268, 7–20–71, Cl. D87—1.
Heine, Helmut A., to Optotechnik G.m.b.H., and Propper Manufacturing Co., Inc. Ophthalmoscope. 221,255, 7–20–71, Cl. D57—1.
Heinrich, Elmer G. Water heater. 221,221, 7–20–71, Cl. D23—86.
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